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Egypt	MR1
Turkey	MB1
Iraq	MH1
Syria	MD1
Lebanon	ME1
Historical Palestine	MF2

/For an account of the organization of agriculture and forms of land tenure and an historical summary of changes in agricultural systems and methods in the countries of the Middle East, see 66: Bonné, M1 Middle East, category 116 as follows: Egypt - pp. 127-129, 192-196, Turkey - pp. 129-130, Iraq - pp. 130-133, 189-192, 202-203, Syria, Lebanon and Palestine - pp. 133-135, 188-189, 203-204./

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[For information on the topography, climate, agriculture and commercial crops, irrigation, stock raising, natural resources, production and supply, waterways, railways and roads of the valleys of the Tigris and Euphrates between the plateau of Asia Minor and the Persian Gulf discussed as one geographical unit rather than by political boundary, see M1 Middle East, Cat. 116, 21: Fisher, pp. 340-370.]

[For information on the topography, occupations and relative productivity of the desert plateau, and of the Arabian Peninsula as a whole, see M1 Middle East, cat. 116, 21: Fisher, pp. 427-449.]

1: Longrigg G-4, 5 (ca. 1915-1940) MH1 Iraq MH1

2. COUNTRY AND PEOPLE

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The zones of land surface into which the territory divides itself, though they belong less to history than to geography, may be briefly mentioned since they deeply affect the life of the inhabitants and reflect their ethnology.

First comes the mountain belt in the north and north-east. A part of the main Armenian and Zagros system, it formed in 1900 the sanjaq of Sulaymaniya and a large part of those of Mosul and Shahrizur. This terrain is wholly un-Arabian, the population solidly Kurdish. Its mountains, mainly barren but carrying also areas of forest, are divided by deep valleys sometimes widening into plains. The hardy inhabitants of its hundreds of villages produce crops of grain, rice, vegetables, fruit, and tobacco, grown on the water of springs and rivulets and the relatively abundant rain. The climate is equable in summer, harsh in winter, the landscape commonly of striking beauty.

In the flattish submontane area of Mosul and Shahrizur sanjaqs lie treeless uplands and the lower courses of the Greater and Lesser Zabs. Here, in ancient Assyria, village-dwelling cultivators grow spring grain crops on rain and, in places, by water-lift from the rivers. The country is intermediate in environment and race between the mountain zone and the hot flatlands of central 'Iraq. The latter, the most extensive and most characteristic region of the country, covered the sanjaqs of Baghdad and Karbalā and most of Ḥilla. Everywhere dead flat and stoneless, it is unblessed, save in rare seasons, by rainfall sufficient for crop-growing, and must needs be cultivated by lift or flow from controlled canals or flood-channels. The crops are winter and summer grain and vegetables, locally some rice, and vast gardens of dates. The population, entirely Arab, lives in mud-built villages or in clusters of hair tents or reed huts.

The equally flat silt-country of the lower Tigris–Euphrates delta, astride and below the prehistoric coast-line, covered the southern part of the Ḥilla sanjaq and almost the whole of the three sanjaqs of 'Amara, Muntafiq, and Baṣra. It was characterized by a higher proportion of reed dwellings, fewer mud villages: by lesser crops of wheat and barley, but extensive rice-growing in the flooded areas: by miles of date gardens, and by a special way of life developed by the buffalo breeders, mat weavers, and fishermen in the great marshes.

Ignoring the Arabian dependencies of Baṣra, two other zones remain to be mentioned. One is that of the Shaṭṭ al-'Arab in the Baṣra sanjaq, with its miles of ordered date gardens in a lean strip between river and desert: the other is that of the arid steppe

1: Longrigg G-4, 5 (ca. 1915-1940) MH1 Iraq MH1

country, often too rainless to produce even the minimum of grazing. It lies, equal in area to the rest of 'Iraq, in the Shamiya desert south-west and west of Euphrates, in the upper Jazira, east of Tigris below Baghdad, and above it astride the Jabal Ḥamrin. These wastes belonged to the true camel-breeding Arab nomads; their inlying fringes, near to the rivers, were the home of the half-settled shepherd sections of cultivating tribes.

The inhabitants of all these regions varied widely in the nearness of their approach to urban civilization and the reach of government. Nearest came the citizens of the towns: then the settled village-dwellers, then the tribal cultivators in their clusters of dwellings, then the marshmen, the half-settled shepherds on the desert fringe, and finally the pure bedouin. These last were and are by far the least numerous element; to regard 'Iraq as largely a bedouin territory is a common error, since much of the country has always afforded the possibility of settled life, and bedouin are found only where no other form of life is possible.

Of the population of the three wilayas, no reliable estimate could be given then or later. The census in Turkish times was conducted, with feeble and venal inefficiency, only in towns and only for conscription purposes. The figures supplied by tribesmen or urban community heads varied with their fears or hopes of liability or benefit. The wilaya of Baṣra in 1900, excluding its Arabian areas, may have contained half a million souls; that of Baghdad perhaps a million and a quarter, that of Mosul less than half a million. A total of midway between two and two and a half million people may fairly be estimated.

The races of which the population consisted, and by each of which some contribution was made, were various. Arabs formed the great majority. But who were these? The folk even of earliest Arabia were of mixed physical types, and it is as idle to look for 'racial purity' in their later offshoots as in other races of the modern world. The Arabs of 'Iraq, in 1900 as today, were Arabic-speaking "Iraqis': a unified amalgam containing physical elements of every population who, from prehistory, had entered the river valleys as invaders or immigrants, and had been assimilated to form that 'Iraqi community which Arabs of Arabia had subjugated in the seventh century A.D. and, by vigour of their arms and faith, had turned into 'Arabs' like themselves. The 'Iraqi people by the end of the nineteenth century were oblivious of—would have denied—any other cultural or ethnic associations.

Within their community the shared tradition and pride of race far outweighed, in most relationships, the differences created by variety of environment, dialect, and material interest: yet these, too, could be formidable as between town and tribe, and as between

1: Longrigg G-4, 5 (ca. 1915-1940) MH1 Iraq MH1

Of the exports of 'Iraq's natural produce, dates were the most consistently important, and supplied, as they do today, a high percentage of the world's needs; and although in preparation, packing, and the technique of marketing the date merchants were backward, yet the culture itself, favoured by every natural advantage, was highly developed, and the famous 'Iraq dates found their way copiously to America, Europe, India, East Africa, and the Persian Gulf. Rice was a considerable but variable export. Wheat and barley—especially the latter—failed to supply exportable surpluses only in years of drought or locust visitation; but the quantities varied widely, and the quality was reckoned among the world's lowest. A few tons of the seed-crops, some gums and gall-nuts from Kurdistan, liquorice-root from the Tigris banks, were smaller but characteristic exports.

The shipping of Arab horses to India was ancient but fluctuating. Hides and skins were sent to Istanbul and Western Europe, clarified fat to India and the Red Sea, mohair to Istanbul and Europe, intestine-linings for sausage-making to America, dog-manure (under its trade-name of 'pure') for tanning to Austria. Various grades of local wool were pressed for export to America and London. By land to Syria went 'Iraqi camels, sheep by way of Mosul to Aleppo, cattle for Egypt, buffaloes for Anatolia.

The forest areas of the mountain belt of northern 'Iraq offered a potential resource of some interest. Between one-tenth and one-fifth of the higher mountains was covered by fairly well grown and productive forest, and as much again by scrub not incapable of improvement. This, in a territory deficient in timber of all kinds and forced expensively to import it, might have seemed to call for development to meet 'Iraq's needs of building-timber, date-boxes, furniture, and fuel. In fact, unchecked quantities of charcoal and fuel, poles for roofing, and foliage for cattle fodder were taken yearly by Kurdish villagers as, without forethought or control, their local supply seemed to make possible. Protection against grazing, encroachment or fire were all equally unconsidered, re-afforestation was ignored, and the stripped hill-sides were offered to the force of winter rains; the resulting erosion would, by way of the descending rivers, deposit the Kurdish silt in the canals of lower 'Iraq and create there an unending problem of clearance. The trees of Kurdistan were oaks of more than one species—including the giver of gall-nuts—and, less numerous, the juniper, wild pear, pistachio nut, walnut, and maple: and, by stream banks on the lower levels, the poplar, willow, mulberry, plane, and tamarisk.

Agriculture was by far the greatest industry in the territory, and the occupation of four-fifths of its inhabitants; yet with all its

1: Longrigg G-4,5 (ca.1915-1940) MH1 Iraq MH1

241 advantage of extensive fertile tracts and abundant water, it made [312] but a poor showing in the exports it permitted, and the low standard of life it sustained. It was, and is, possible indeed to exaggerate the potentialities of 'Iraq agriculture;[1] areas cultivable by flow or lift-irrigation are not unlimited;[2] even with the best of conservation, its river-water resources can never suffice, at one time, for all or nearly all its irrigable lands; and the rains[3] upon which northern 'Iraq wholly depends are capricious and rarely sufficient. Barrage-irrigation could never be as easily achieved as in Egypt, and its cost must always place at a disadvantage, against a Canada or a Russia, countries which like central 'Iraq are dependent on it. The indigenous 'Moroccan' and the invading 'Najdi' locust were an annual menace to crops. The 'Iraqi *fallaḥ*, even when helped by a large measure of mechanization, was and is no match for the European or North American as a producer.

511 In the 'Iraq of 1900, at any rate, there were reasons enough for agricultural, and therefore universal, poverty. Conditions were tolerable in the rain-fed areas of Mosul and Shahrizur, where village organization prevailed, taxation was reasonable, the dangers of flooding unknown, land-holdings often small and personal: tolerable, too, on other lines, in the Shaṭṭ al-'Arab date-belt where security was good, society well rooted, and the growers' skill highly developed. If even in these two zones a lifetime of debt and near-starvation were the lot of most men, elsewhere, throughout lower 'Iraq, neither the social structure nor Government measures towards land settlement had produced conditions within which progress was possible. Security was habitually threatened over great areas by the aggression of neighbours or the depredations of the *badu* and their hungry camels. Even where tenure was reasonably secure, the prevalent crop-sharing system supplied but the barest living to the cultivator: the shaykhs and their agents, absentee landlords, and a blindly grasping Government combined to remove both the reward of past and the incentive for future toil. No shaykh and no landlord conceived a duty of improving productivity; wherever local agriculture called for combined and organized effort—silt-clearing, flood-bank protection, locust warfare, drainage—they provided no capital, no superior guidance, little co-ordination, no sense of social obligation. Government

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[1] It may be that, even in the legendary past, agricultural prosperity was somewhat less than is vaunted: the rains were no more copious, floods as ruinous, the swamps as vast, the *badu* as rapacious; and the great canals, to judge by the lack of surviving ruined headworks, may have been, after all, only flood-channels annually silt-cleared.

[2] Some 20 million acres in irrigable areas (south and central 'Iraq), 10 million of rain-lands in the north. [311]

[3] The annual average for Mosul area is some 450 mm., and more in the hills: in central 'Iraq, 150 mm.

1: Longrigg G-4, 5 (ca. 1915-1940) MH1 Iraq MH1

itself had rarely the knowledge, the physical control or the resources to initiate new methods or improve the old.

The cultivators themselves, mediocre in physique and discouraged by their circumstances, were resigned to accept the lowest subsistence level as the best which life could afford them. Their cultivation methods remained primitive. They had, indeed, their technique of small-scale water control, their wasteful but practicable methods of water-lift. They could be prompt to benefit from occasional rain or the wet silt of shrinking rivers, had mastered from early childhood their simplest of equipment. But there was no improvement in the quality of the few crop varieties grown, no experiment in new techniques, no ambition for purer seed-types which could have doubled the merchants' prices, no reluctance to offer adulterated or uncleaned produce. There was a dead or deadly conservatism, backed by centuries of habit and dull fatalism. Only on the Saniya estates were there signs that other standards might, without miracle, be achieved; with better security due to a favoured use of the *Zaptié*, modern buildings, regular silt-clearance, a minimum of helpful organization and financing, the Saniya lands offered a spectacle less mournful than the generality of 'Iraq agriculture—but had solved none of its major problems.

Of these, some were evident enough: problems of security both of tenure and of life, of the means to perform the communal functions of the countryside, of finance, of rural education, of taxation, and rent. Of the irrigation problem, vital to 'Iraq society and economics in every age, more must be said. 'Iraq, from this viewpoint, offered not only high hopes but grave difficulties, which in 1900 no attempt had been made to master. It was the chief of these that the Two Rivers vary more than tenfold seasonally in their discharge, whereby the beds sufficient for their discharge in the dry months are wholly inadequate to take their flood waters. The result must be wholesale flooding; and indeed great areas of land in central 'Iraq are below the high flood-level of the rivers. Secondly, the April flood season, when alone the river-levels have 'command' of riverain lands, begins too late to mature the spring grain crops, and ends before the ripening of the summer grains and vegetables. The basic requirements, therefore, were and are evidently five: protection against ruinous spring flooding: storage of flood water, for re-use in the low season: establishment of barrages to maintain river levels which will secure command by flow-canals at essential seasons: control of the canal-heads by regulators; and, finally, provision for main as well as local drainage, to prevent the otherwise inevitable and actually widespread salination.

1: Longrigg G-4, 8 (ca. 1915-1940) MH1 Iraq MH1

312 The daily lives of more Iraqis could be affected by progress in
653 agriculture than by even the greatest industry, and such progress in this period was not negligible. The grandiose irrigation schemes for which the press and public called were not, indeed, at once attainable; maintenance, minor improvement, and research were rather the order of the day. Nevertheless, some works of fair magnitude were carried out. New headworks and canalization on the Diwaniya and Daghara branches of the Euphrates were undertaken, and improvements in the water-supply to the Suq rice-lands. Swamp-drainage at Karbalā was primarily a public health measure. A permanent weir across the Diyalā replaced annually renewed antiquated works and secured supplies for the Ruz, Khurasan, and Maḥrut canals. The Laṭifiya Canal, the new Iskandariya, the Shayshubar were dug or re-aligned. A clearance of the Baṣra creeks and a major regulator, opened by the King in 1930, on the Bad'a in Muntafiq country were works of great local value. With them went continuous researches, surveys, experiments in desalination and drainage, and efforts to maintain and improve the 'bunds', breaches of which could ruin a countryside as they did in the disastrous floods of 1926 and 1929, and the necessity for which only the completion of the long-standing flood-diversion schemes could remove. Such was the Ḥabbaniya project, conceived by Willcocks twenty years earlier and closely restudied from 1927 to 1932; in the last of these years tenders were called for and the work seemed imminent. Other major plans, postponed by lack of funds and incomplete data, were the Tigris barrage at Kut al-Amara to restore the Gharraf and to control the 'Amara rice-lands: the smaller Abu Ghurayb canal from the Euphrates left bank, begun in 1932: an 'Aqar Quf drainage project near Baghdad: a proposed reservoir at or near Qizil Rubaṭ to conserve Diyalā water for summer use: a new head for the Ḥilla branch: the Isḥaqi Canal, to take Tigris water from opposite Samarrā: and work on the main Euphrates channel near Shinafiya. The Irrigation Department was administered from 1925 to 1928 by L. E. Bury, who acted also as Adviser to the Ministry of Works and after 1927 to that also of Irrigation and Agriculture. W. Allard succeeded as Director of Irrigation from 1928 to 1933, and as Chief Engineer under an 'Iraqi director in 1933–4. Wheatley resumed the adviserships of Communications and Works in 1929, and held it for the next eight years.

241 Of the need to improve agricultural methods, if these canal
654 works were to yield all their value, the public was little aware. In spite of continued research and experiment, the main agricultural problems of the territory were yet unsolved—those of soil deterioration, antiquated techniques, inferior crop varieties, low and impure yields, and harvests endangered by flood or drought.

1: Longrigg G-4, 5 (ca. 1915-1940) MH1 Iraq MH1

Their solution must depend on the simultaneous and widespread working of forces of rural education, reliable security, sound land tenure and properly financed enterprise. Meanwhile, the annual locust campaigns in northern 'Iraq were developed jointly with neighbouring countries. Progress was made in hill-country tobacco-growing and treatment of the leaf on modern lines. Silk experiments continued, though with scant success. Cotton-growing was still restricted by unskilled cultivation and by pests. The produce of the great date-groves of southern 'Iraq was bringing difficult problems not only of improved culture but of organization and disposal, and civil war raged between growers and packers. Of the attempts at modern estate development (p. 17) none had yet succeeded. The projected Agricultural Bank could not, it was found, be inaugurated until clearer land-titles gave security for loans. The Asfar Concession was limited and revised to provide for the acquisition and development by the Company of the Latifiya estate, south of Baghdad; the Irrigation Department constructed the main canal at the Company's expense, and promising operations on the 65,000-acre area began under European management.

The main agricultural development of the time was that of river-side pump irrigation. This had been initiated before 1914 and moderately extended between 1920 and 1925. Aided by important fiscal privileges, it began thereafter to show remarkable increase, to the point of becoming a main feature of 'Iraq's economy. Installations in the liwās of Baghdad, Diwaniya, Kut, 'Amara, and Diyalā had by the end of 1930 brought the number of pumps to over 2,000, representing a million-acre increase of cultivable area. There was evident value in thus attracting capital to agriculture, utilizing the cheap oil available, exploiting the high-lying virgin lands, and avoiding the precarious chances of flood irrigation. But the development was not free from trouble. The attraction of cultivators to new lands rather diverted them from old than increased their numbers; improvement in yields, due to fresh lands and secure irrigation, was not matched by superior type or purity of crops. Estate management attempted by townsmen was sometimes short-sighted and uneconomic, and the hard times and low prices of 1930–1 brought ruin to many hopeful enterprises. These, moreover, jointly undertaken by an urban capitalist—often a Deputy or city notable—and a tribal shaykh or *sirkal*, were productive of puzzling difficulties of land tenure and rights. Neither the traditional occupancy of the tribe, nor the share claimed by the incoming capitalist, had any basis in law. Agreements between the parties often proved unworkable, and in practice did not always bring blessings to the cultivators. These conditions indicated, yet

1: Longrigg G-4, 5 (ca. 1915-1940) MH1 Iraq MH1

by their many successors in later years was criticized by some as too favourable to the shaykhs and half-absentee urban land-developers, and unjust to the actual cultivators. It was true, indeed, that thousands of these remained legally landless and as dependent as ever; that many shaykhs, whose agricultural functions had been always limited and ill performed, became the registered owners of personal heritable '*lazma* rights' of considerable areas: and that town-dwelling pump-land exploiters were over-rewarded, by similar grants, for their enterprise. The criticism is not baseless, but has been commonly exaggerated. The Committees created no rights; they recorded what rights they found to exist. Their members were officials of 'intelligentsia' type with no shaykhly sympathies (but rather the reverse), and they sought genuinely among the cultivating workers on the land for '*lazma* right' candidates who could produce valid claim to some years of continuous past occupancy or revenue-paying; in tens of thousands of cases they found and recognized them; and only in the absence of such claims were rights registered in the name of the shaykh and his family.

No title was ever assigned to an absentee shaykh, though the residence of some of the grantees might be intermittent and not on the precise lands concerned. Of the rich townsman who obtained title to broad acres, it was just to recall that, spending capital and accepting the grim risks of 'Iraqi agriculture and an uneasy partnership, he had developed lands hitherto desolate and could perform, as the single cultivator lacking wealth, knowledge, and authority could not, the functions of landlordship in organization, capitalization, and improvement. In northern 'Iraq, small-holding was the rule and was defined and stabilized by the settlement; in central 'Iraq, though the new security of tenure and the lessening of boundary squabbles did not wholly comfort the laborious, underprivileged, ever-indebted fallah, whose personal lot was little improved, they removed a large part of the adverse background of shifting rightless chaotic land tenure which had long afflicted 'Iraqi agriculture. The indignation of Abu al-Timman's group under the Ṣidqi régime at the remaining inequalities led to the suspension of *lazma* grants; but the procedure under the original law was soon restored. Meanwhile Government pursued schemes to construct model villages, good in conception but at present trifling in results; and the settlement of nomads was attempted on the Abu Ghurayb and Ḥawija canals.

Agriculture proceeded on its ancient lines, but with an increasing official consciousness of its inadequacy. The bad preparation, the dirt in and adulteration of produce were still the despair of merchants, as were the archaic and wasteful methods, inferior crop

1: Longrigg G-4,5 (ca. 1915-1940) MH1 Iraq MH1

241 473 types, and low yield depressing to the ambitious farmer. The Baṣra date industry, in which British and American packers and exporters had a dominant share, made its divisions yet more explicit in 1933 by the appearance of rival organizations within it: the Government-approved Date Growers Association on the one side, and an association of date packers on the other. The clash of interest and tactics between these two, both fully representative of their respective interests, resulted in disastrous conditions in the industry and led in 1935, after a visit to Baṣra by Yasin Pasha, to the passage of a law establishing a Date Board with representatives of all Baṣra date interests and its own direction and revenues derived from a small export tax; it effected for a time a marked improvement in growing, packing, and exporting conditions. A Committee was set up in 1933 to investigate beet-sugar production, and found reason for hopefulness. The first suggestions were heard of a monopoly for the manufacture and marketing of tobacco products, and meanwhile something was done to improve the drying, cutting, and packing of the Kurdish leaf. 'Iraqi cotton, the object of high hopes ten years before, passed through a depressed period. The crop climbed slowly to 5,000 bales by 1928, only to drop almost to nothing and to recover to 3,000 bales in 1934. Thereafter substantial yearly increases appeared, and by 1938 15,000 bales were produced. Among the cotton-growers was the Laṭifiya Company (p. 213), an enterprise which, however, found itself early in its career in serious difficulties. It failed in its undertaking to repay the cost of its canal to Government, and in 1935 control was assumed by Messrs. Andrew Weir & Co.; thereafter, with fresh finance and a revision of its agreement with Government, the progressive agricultural work of the estate could proceed. It was to remain under single and personal British management for the next twenty years. The Agricultural and Industrial Bank was unable, in its early years, to do much for the public.

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241 312 Pump irrigation, which the economic crisis of 1929–31 and the prevailing low prices involved in widespread losses and stoppages, recovered gradually after 1933 and stabilized itself as a main feature of 'Iraqi production. It had introduced, for better or worse, a new element into local agriculture—the urban capitalist; and it helped thus to lead part of the wealthier class to a fresh interest in rural affairs and modern forms of land development. In flow irrigation the period—the first in which surplus State funds became modestly available, thanks to oil royalties—was one of progress. The first stage of the forty-mile Abu Ghurayb canal, from the Euphrates left bank below Ramadi, was completed in 1936 with a considerable commanded acreage. The Mishkhab regulator, low down on the Kufa channel of the Euphrates, was built in 1936. A canal deriving

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Politics and war-attitude apart, conditions in the territory throughout 1940 were as secure and tolerable as could be hoped. A number of offenders sentenced by the courts martial of previous régimes were liberated, the State of Emergency at al-Rashid camp, in force since March 1939, was brought to an end. Ṣubiḥ Najib was pardoned and released. The Ministry, to whom in some circles the revered Gaylani name was an asset, declared war on immorality, shut places of evil entertainment or drunkenness, and ostentatiously improved Waqf buildings. The foundation stone of the Faysal Mosque was laid. Observance of the Ramaḍhan fast was enforced by the daytime closing of restaurants. The completion of the Baiji–Mosul section of the railway, with its long tunnel, permitted at last a direct Baghdad–Istanbul service, though rolling stock available for use was of the scantiest. Work at the Ḥabbaniya reservoir was pressed forward. Oil production was normal again since the month-long interruption in September 1939, and both pipelines remained in use until the stoppage of pumping, on the Tripoli branch into Vichy–French territory, in July 1940. The sowings of cotton were much increased, and 25,000 bales produced. The Government tobacco monopoly was brought into effect, to the chagrin of many Kurdish growers whose freedom of disposal it curtailed. Agriculture was everywhere encouraged with a view to full national self-sufficiency, though the disastrous spring floods were a reminder of its precariousness.

Commercial and industrial life strove to maintain normality, or even progress. An ambitious Co-operative Society to produce fruit preserves was founded. The Agricultural and Industrial Bank was busy with loans to cultivators, and with the sale and servicing of agricultural machinery; it advanced money also to a new ginnery at 'Aziziya, took shares in the 'Iraq Cement Company, and helped a vegetable-oil extraction plant. Work proceeded on the Baghdad automatic telephone installation. The budget for 1940–1, which allotted a third of all revenues to the Army, found room for the cost of completing the irrigation work on the Abu Ghurayb, and for the Ḥawija project, the Diyalā weir, the Shamiya river improvement, and the 'bunds' around Baghdad. The credit allowed by the banks and *ṣarrafs* was extended or restricted according to the war news, market prices rose and fell, Government's control in the economic field was discreet and indeed largely inoperative. Shortage of shipping and transport vehicles were a serious hindrance to the export trade, whether conveyed by sea or by the land routes. A Turkish mission visited Baṣra with the hope of securing a southern gateway of entry for their country. The loss of French purchases of 'Iraqi wool was severely felt; trade with Japan on the contrary seemed likely to develop fast.

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even the basic validity—of the oil concessions was a usual move of politicians in opposition.

In the greatest of 'Iraq's industries, that of agriculture, the war was a period of unusual activity, stimulated by the need to produce and by high prices. Agricultural machinery, thanks to lend-lease supplies, was seen almost for the first time in the northern liwās and those of Baghdad and Kut; in 1945 some scores of tractors, mechanical ploughs, cultivators, and combines were in operation, with great effect on 'Iraqi conceptions of agricultural possibilities. Projects for ambitious modern farming took shape among the educated and the owners of capital; a College of Agriculture had been founded in 1941; and a law was passed in 1944 authorizing the establishment of agricultural Co-operative Societies. But none of these measures prevented the increasing drift of countrymen in their hundreds or thousands towards the towns, where war-time employment was plentiful. In the field of land settlement, the committees, which had worked steadily and in increased numbers since 1933, were wisely kept at their all-important tasks throughout the war. Only minor attention was given as yet to southern 'Iraq, and little to Mosul, Arbil, Dulaym, Diwaniya, or Karbalā liwās; but much was done in the dispute-ridden agricultural lands of Kirkuk, Baghdad, Ḥilla, and Diyalā, where good progress was made with definition of land categories, the mapping of boundaries, and the recording of individual registrations over areas which now approached a million acres. Much was heard of plans both for model villages and for the allotment of small-holdings of Government land to single families—a sign that the evils of peasant insecurity, poverty, and lack of incentive were now fully realized. On the Dujayla Canal, dependent on the Kut barrage, work under a special law started in 1945 on a practical settlement of families on sixty-acre State-owned plots, with the incentive of free title to be gained after ten years of work; and meanwhile village institutions and amenities—school, farm offices, nurseries, dispensaries, and a co-operative store—were provided by the Directorate. The Dujayla Scheme was full of promise; it started with eighty carefully-chosen families, later to be multiplied tenfold, and it aroused keen competition for admission.

'Iraq's security after 1941 allowed its vital Irrigation services to continue their canal maintenance and flood protection, their studies and planning, though the intended major projects could not at present be initiated. The work interrupted in 1941 on the Ḥabbaniya–Abu Dibis outlet was completed by 1943, and the intake-channel from the river (begun under Willcocks) and the return-channel to it, were redesigned but not yet undertaken. Pump irrigation was fully maintained.

1: Longrigg G-4, 5 (ca. 1915-1940) MH1 Iraq MH1

channels of international trade were under frequent exploration at 'Iraqi or foreign initiative; during 1945–50 approaches were made by Italian, Yugoslav, Czech, Spanish, Pakistani, and Japanese governmental or commercial bodies. The Persian transit trade by way of Khaniqin persisted, but on no scale comparable with that of a generation earlier and with small hope of increase; and both Persia and Turkey used routes through 'Iraq for the export of small quantities of their goods. The general aspect of 'Iraq's foreign trade was thus, at the end of 1950, on a scale which must seem paradoxically humble in quantity and value for the country's size and potentialities. It reflected the continuing precariousness and backwardness of its agriculture, the slightness of its industry, and the lack of marketable natural resources other than oil. But the new age of accelerated development which could be expected to date from 1951 would not, it was certain, fail to affect and increase both its production and its absorptive power.

Foreign and 'Iraqi Banks, and the *ṣarrafs*, whose numbers the exodus of Jews had diminished, offered the normal services to trade in the provision of credit and discounting of bills. Insurance facilities were given by branches or agents of many British companies, and an all-'Iraqi Insurance Company was in 1950 a project designed on patriotic lines to 'diminish economic dependence' on the world abroad. The currency issued and managed by the National Bank since July 1949 remained that of the 'Iraqi dinar based on sterling, to which bloc the country belonged—but not without a movement or outcry, favoured by some economists and patriots, to secede from it.

Agriculture must remain ever the country's chief resource, and was still the life's occupation of more than two-thirds of its people. Previous pages have referred to the essential problems of 'Iraqi farming and shown that, for all the efforts of a small department to solve them, little had so far been done to modify the country-wide ancient practices, ignorances, deficiencies, and dangers. But there were, by the mid-century, many hopeful signs. The problems were understood; the social as well as the economic importance of a prosperous countryside, and its connexion with security and with politics, were appreciated. Modern agriculture had attracted the interest and efforts of a part of the educated and capital-owning public; there were even those who preferred it to politics! Tribal shaykhs as well as town-dwelling landowners were found, here and there, to be mechanizing their holdings, abandoning ancient methods and, partnered with scientists, eagerly experimenting. New crop varieties were under trial, the power and range of pumping installations had multiplied, mechanization was diminishing dependence on the indifferent labour of crop-sharing peasants.

1: Longrigg G-4, 5 (ca. 1915-1940) MH1 Iraq MH1

241 The Laṭifiya was no longer the only large-scale modern estate in
185 operation. The Date Board, which had done much to modernize
473 and stabilize the production and marketing of dates—and not those of the Shaṭṭ al-'Arab only—had wisely retained the system of export monopoly, with suitable amendment of terms and prices, throughout the war and after it, but the three-year extension granted to Andrew Weir & Company in 1950 was likely to be the last; the National Date Trading Company founded in that year would probably assume the functions of the export monopolist. Of the Company's own shares, 49 per cent. were allotted to the Date Association, 26 to the public, and 25 to the foreign packers and exporters.

654 Government maintained a College of Agriculture with a three-
242 year course and main experimental estates at Abu Ghurayb (for
185 agronomy, animal husbandry, pests, and soils) and at Za'faraniya (for horticulture, fruit, and vegetables), with smaller stations at Bakrajo, Ḥawija, Nineveh, Aski Kellek, and Baṣra, a main forestry station at Arbil, and nurseries in every liwā. Its experts selected, tested, and issued new seed varieties designed for higher yield, quality, and resistance: combated pests, notably by locust campaigns in the technique of which 'Iraq claimed to lead the world: caused the erection of a grain silo at Baghdad, and proposed another and greater at Baṣra, with modern grain storage bins at many centres. The department was in touch with local industry which could use as raw materials 'Iraqi oil-seeds, cotton, dates, barley, beet, wool, and tobacco. It was planning large-scale experiments in estate-management, and seeking crop rotations which would diminish the use of a fallowing system now recognized as intolerably wasteful. It was encouraging the growth of rural co-operative societies under the 1944 law, increasing its departmental Inspectorate, and founding Chambers of Agriculture. It interested itself in rural education and established agricultural schools in every liwā. It was promoting village settlement, in which field the interesting and promising Dujayla smallholding community (p. 323) was extended and perfected, and the foundation of others in the Ḥawija and elsewhere was put in hand. The Development Board allotted in 1951 more than 4 million dinars for the provision, in six years, of artesian wells and drinking-water supplies. The mechanization of agriculture was fostered by a country-wide system of depots and repair shops, administered as a Government monopoly under a special law and a separate Directorate-General; indeed, all the importance of mechanization—even with its serious difficulties of proper maintenance and supply—was appreciated as part of a future 'Iraqi agriculture which with great new areas under controlled irrigation was likely to find not land or water but man-

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312 movement in Table VI clearly, if not as completely and as accurately as I hoped to do. Although the figures given are incomplete and inexact in places they can be relied upon in the aggregate to furnish a trustworthy general picture of events. It will be seen that whereas in 1921 there were probably something like 140 pumps averaging about 11 horse power installed almost exclusively in the Baghdad and Amara Liwas, in 1929 there were over 2,000 pumps averaging from 25-30 horse power extending along all the principal waterways of the country. On the estimated basis of 50 *misharas* * per horse power the area irrigable by the former was about 200, by the latter about 7,400 square kilometres. According to Table I the total area of the riverain tracts affected is over 10,000 square kilometres; but only a fraction of this can be annually cultivated. The data are crude and the results must be regarded merely as rough approximations: but they indicate the wonderful extension of private pump irrigation that has taken place during the last ten years. It is [439] also interesting to note that the importation of pumps for irrigation purposes during the ten years 1920 to 1929 were 28, 110, 42, 18, 157, 157, 288, 288, 468 and 570 respectively, or a total of 2,066.

It is my duty in this report to consider this development primarily from the point of view of land tenure and in that connection to make some criticisms about the methods of land acquisition adopted that appear obvious enough now. Seriously as I think these errors have jeopardised the success of many of the pump undertakings, this should not be allowed to obscure the beneficial character of the general effort made, the valuable safeguard against famine that it provided, and the [166] powerful incentive to settle on the land that it created. And if the movement had not unfortunately coincided with the severest economic depression that the civilised world has encountered, the effects of the initial mistakes made would have been less prompt and less serious.

241 464 465 439 6. The general failure of a development from which so much was hoped, is ascribed jointly and severally to a number of causes. Among these may be mentioned (*a*) the absence of a suitable paying summer crop, (*b*) the shortage and indisciplined character of available labour, (*c*) the prevalence of the share system of payment for labour and the consequent dislike felt by agricultural workers for crops that cannot be shared on the field in kind, (*d*) the lack of competent and dependable local agents and mechanics, (*e*) the poor and dirty quality of much of the produce and the consequently poor reputation of Iraqi agricultural commodities in the world's markets, (*f*) the defects of internal and the costs of external transport, (*g*) the general economic depression of the world and the glut of the world's markets with grain.

185 The question is such an important one, not only from the point of view of those who have sunk money and effort in these enterprises but also owing to its effect upon the prosperity and well-being of the whole country, that the Government for a long time have sought remedies in special legislative proposals designed to remove some of the difficulties mentioned. Among the objects more particularly aimed at may be instanced: the enforcement of the cultivation of a certain proportion of money crops (e.g. cotton), the binding of labour more closely to the soil, and the better regulation and more effective use of such labour. The power of legislation to bring about these and other improvements in the economic conditions of this extensive agricultural development, appears to me to be over-rated and the dangers of restrictive legislation operating adversely to be insufficiently realised.

312 Most of the causes enumerated earlier have probably exerted a

* A mishara is reckoned = 2,500 sq. metres.

3: Clark S-5 (1950) 1951 MH Iraq MH

of modern pump irrigation, both landowners and urban speculators were able as pump providers to secure further advantages over the small peasant cultivator. The outcome of this combination of cupidity and circumstance is such that an experienced investigator into the land problems of the Near and Middle East maintains that 'the bulk of the land has come into the hands of a class from whom no leadership in agricultural methods can be expected and which is tyrannous, callous and oppressive'. This generalization is, however, not entirely just, for a minority of the landowners appear to take a greater interest in the welfare of their tenants than might be assumed. But, with few exceptions, the share-cropping peasant cultivator of Iraq lives a hard life of poverty which is only mitigated by ignorance of better conditions.

It is necessary that this problem of land tenure and its effects on the economic and social life of the country should be fully appreciated, and this for three vital reasons.

Firstly, the land is the main source of the future wealth of Iraq, and consequently of revenue for educational and other social purposes. There are, of course, those other possible sources of increased revenue indicated earlier in this chapter and, as will be suggested later, it is to be expected that the steadily increasing royalties from oil exploitation will contribute to the country's resources for social progress. But it must be reiterated that the most important source of national wealth in Iraq is the land.

Secondly, although improved methods of agriculture and of the organization of rural life are badly needed, these are hardly likely to be promoted by landowners who are interested in the *status quo*.

The agricultural productivity of 'the land between the two rivers', once renowned for its robust fertility and abundant crops, has fallen to an extraordinarily low level. The superficial causes of this lamentable state of affairs are primitive methods of husbandry, the lack of application of power and science to the land, insufficiency of irrigational facilities and the misuse of those that exist. Until improved methods of cultivation, stock rearing, harvesting and marketing, accompanied by a sound system of agricultural education both in the schools and at the adult level are applied, there can be little prospect of the land of Iraq being that rich source of wealth through which the people may live more abundantly. These improvements, however, are not likely to materialize under the existing land tenure system.

Thirdly, there can be little expectation that Iraq, constitutionally a democratic country, will develop effective democratic institutions, both centrally and locally, so long as the standards of the bulk of the population remain at so low a level.

3: Clark S-5 (1950) 1951 MHI Iraq MHI

CHAPTER FIVE

SIGNIFICANT RECENT AND CONTEMPORARY ADVANCE IN IRAQ

Although the various obstacles outlined in the previous chapter are serious ones, there is a growing body of evidence which suggests that certain of them are being at any rate partly overcome; some of them in ways which are significant pointers to the directions along which positive advance towards compulsory education may be possible.

ECONOMIC AND SOCIAL ADVANCE FAVOURABLE TO EDUCATIONAL DEVELOPMENT

Certain economic and social advances are taking place which are likely to be favourable to the development of education, both as regards producing more revenue and in improving the standard of life of parents so that they can afford to allow their children to attend school.

Evidence of Improved Agricultural Practice. A few of the more enlightened landowners, especially those who are not absentee landlords and take an active interest in their farms, are engaged in the important business of applying power and science to the land. Large tracts of land in the rainfall region which have not previously been cultivated are being opened up by the mechanical plough. Indeed, it has been fascinating to see land which was hitherto regarded as desert being ploughed at night by modern tractors with headlights. Other landowners and farmers are experimenting, with considerable success, in the growing of relatively new crops such as American cotton of high quality. In some of the northern provinces there are cattle bred to considerably higher standards than formerly. The writer was present at a lively discussion between farmers who were suggesting ways of conserving by modern silage the nutritious spring vegetation most of which is at present only scantily cropped and then left to be burnt up by the summer sun.

It has also been gratifying to observe the growing interest which is being taken in certain of the experimental farms organized by the Directorate of Agriculture.

3: Clark S-5 (1950)1951 MH1 Iraq MH1

If developments of this kind proceed it is likely that the agricultural productivity of Iraq will increase considerably. Although most of the profits will find their way into the pockets of a few, more taxable wealth is likely to be produced which could wisely be devoted to the development of educational and other social services. Indeed, if means could be devised of applying income tax to such profits, considerable additional revenues for public services would accrue.

The Dujaila Project of Land Settlement. But perhaps the most hopeful and significant economic and social development which is taking place in Iraq is the Dujaila Project of Land Settlement.

Some years ago, as one of the first attempts at land reform, the Government distributed parcels of land to small, independent farmers. The Government provided the irrigation facilities and, on the land which could consequently be brought under cultivation, allowed families to settle. The scheme was not nearly so successful as it should have been, partly because some of the tenants lacked sufficient farming experience but mainly because it was not accompanied by a scheme for providing agricultural advice. Further, because of the failure to institute adequate drainage arrangements, there is a danger that much of the land in the settlement area will lose its fertility through otherwise avoidable salinity.

In the Dujaila area, in the province of Kut, the Government are now in process of organizing a much more satisfactory and intelligently conceived scheme of land settlement. In 1945 a large tract of hitherto uncultivated land, roughly seventy kilometres long and about half that distance wide, was selected as an area for land settlement. The scheme is being organized by a department known as the Dujaila Directorate to which a reasonable delegation of powers has been given. Its main features may be summarized as follows:

(1) Each settler, who must have had previous agricultural experience in or near the locality, is provided with a holding of about sixty acres. The settler has to sign a well-devised form of contract which binds him for a period of ten years to farm his holding in accordance with advice given by the agriculturalists and horticulturalists attached to the Directorate. At the end of ten years the holding is apparently vested in the holder in a form of limited freehold.

(2) Each settler is eligible to apply for an initial grant not exceeding £100 for the purchase of equipment, assistance towards the building of his house and farm buildings.

(3) Each settler must plant sufficient trees around his holding,

3: Clark S-5 (1950) 1951 MH1 Iraq MH1

must establish a horticultural plot, and on his arable land must maintain a balance between summer and winter planting. He must also devote sufficient land for stock pasture.

(4) Each settler must, from his own resources, level, hedge and provide irrigation ditches for his own plot.

(5) A co-operative society is formed and run by the holders. So far some 1,026 holdings have been established in the Dujaila area, and the total population of adults and children is between 12,000 and 15,000. At present there are only two schools with a total roll of 300 children, but the parents appear to be pressing for more educational facilities and two new schools, of good design, are in process of construction. The Provincial Director of Education, who takes a keen interest in the scheme, has plans for a distribution of primary schools throughout the whole area to avoid long travel by young children, and also wishes to establish intermediate and secondary schools situated in a central village which is about to be built. He is anxious that the upper forms of the primary schools shall develop a rural bias and that the intermediate and secondary schools shall have 'agricultural streams'.

It is perhaps early to judge the success of this scheme, which has been in operation for only four years and is still in process of development. From carefully checked evidence, however, it appears that the holders, most of whom were previously landless cultivators living at a low subsistence level, are making an average income of between £300 and £400 per annum. The sponsors of the scheme also maintain that, whereas the average grain produced from one dunum of land on privately owned farms in the neighbourhood is 100 kilos, the average from the same area in the Dujaila district is 250 kilos. From admittedly superficial observation the tenants would certainly appear to be living a richer and more robust life than their neighbours who remain landless cultivators. Many of the tenants have provided themselves with houses which, by local standards, are comfortably designed and furnished. The men have an appearance of dignity and independence. Indeed, it is claimed that 'you can always recognize a Dujaila man in the streets of Kut because of his confidence and bearing'.

The scheme has, possibly, certain deficiencies in that the tenants, apart from improving their holdings by tree planting, hedging and irrigation channels, are required to pay no rent. True they make a certain contribution to the public purse through the sales tax, but it may be wondered how wise it is to encourage an attitude of 'something for nothing'. Public services are badly needed in Iraq and even new land settlers should realize that they must be paid for. It is understood, however, from discussion

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135 (2) The Supply of RAW MATERIALS AND POWER: Iraq is potentially
233 rich in many kinds of raw materials. In the first place it has abun-
241 dant supplies of oil and gas which provide a cheap source of both
433 raw material and fuel. Secondly, it has pastoral and agricultural products such as wool, camel hair, hides and skins, meat, fish, milk, animal fat. Thirdly, it has fertile land which, with the extension of irrigation, can be a rich source of such raw materials as sugar beets, sugar cane, soybeans and jute, in addition to products already available such as tobacco, cotton, sesame, linseed, and practically all types of grain, fruits and vegetables. Finally, recent geological surveys have located outcrops of iron, copper, zinc and chrome ores. There are deposits of sulphurs, apparently of commercial value, in many parts of Iraq, and of salt, especially near Basrah. Yet each of these resources presents a different problem; none is easily exploitable (except oil); quantities available for industry are limited and the quality frequently poor. Agriculture has been kept at a low level of output because of the lack of irrigation schemes in most parts of the country; the difficulties caused by the present land tenure system and the agricultural techniques connected with the tribal system, which covers over 80 per cent of the cultivated area; the absence of an effective agricultural extension service and lack of modern storing facilities; these and other factors have held back both quantity and quality of agricultural and animal products. There was a noticeable extension in the cultivation of cotton in recent years, but the severe failure of the crop in 1951, owing to a pest attack, has been a great set-back. Difficulties in the supply of raw materials have held up many an industrial enterprise. The scheme for a sugar factory which has been under discussion since 1947 has had to be postponed from one year to another owing to the uncertainties connected with the
[281] cultivation of both sugar beet and sugar cane. The progress of the leather tanning industry, one of the oldest industries in Iraq, has been retarded due to the existing conditions in which hides and skins have been prepared and preserved, and great losses to this particularly native industry have resulted. The woollen textile
[289] mills have had to import certain qualities of Australian wool to mix with Iraqi wool which is of a coarse variety.

135 So far as mineral resources are concerned the surveys that have been made are insufficient.[1] Further exploration work is

1 As of writing, in July 1953.

6:Ireland S-5 (no date)1937 MHI Iraq MHI

'IRAQ

Irrigation and Agriculture

175* 241 312 In a country so predominantly agricultural as 'Iraq, where rainfall, generally speaking, is too slight for its needs, the provision of irrigation from the rivers, the traditional source of the country's prosperity, remains one of the major problems. The problem of irrigation, however, is more than one of mere extraction of water from the rivers. It is also the maintenance of the natural drainage of the country, its protection from floods and the preservation of navigable waterways.[1]

After the Mongol invasions in the thirteenth and fourteenth centuries, the early irrigation systems, the remains of which can still be seen, collapsed. No government which assumed power was able to maintain canals or regulate the flow of water. Each man did what was good in his own eyes. Many canals silted up. Other canals, cut in the banks by the cultivators, without adequate knowledge or without regard for the future, came to carry more water than the parent river. In many cases, the abstracted water because of improper drainage ruined the land through salination or else filled vast marshes. The rivers, unable to scour their beds in the lower reaches, increased the dangers from floods and hampered navigation.[2]

Not until comparatively modern times were efforts made by the Turks to prevent flooding and to secure the services of engineers to study and to undertake irrigation works. The most prominent of the foreign engineers was Sir William Willcocks who, from his appointment in 1908, studied and proposed schemes for the irrigation and drainage of the country.[3]

[1] *Note on Irrigation in Mesopotamia, December*, 1919 (Baghdad, 1920), p. 9.

[2] Ibid., p. 7; *Brief Note on Irrigation Work in Mesopotamia and the operations of the Irrigation Directorate, M. E. F., up to November*, 1918 (Baghdad, 1919), p. 1.

[3] His programme, in brief, was: the construction of two barrages on the Euphrates at Hindīya and at Fallūja, and two on the Tigris at Kūt and Balad; the construction of a proper canal system from these barrages; the utilization of the Habbānīya-'Abū Dibbis depression as an escape for the flood waters of the Tigris; the regulation of the swamps above Basra; the rehabilitation of the Nahrwan Canal from the Diyālā; and the provision of drainage, escapes and afforestation in connection with the entire programme. Willcocks, Sir W., *The Irrigation of Mesopotamia* (1917, 2nd ed.), pp. 15 ff.

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INITIATION OF ADMINISTRATION

The Turks, however, lacking both money and initiative for his whole programme,[1] undertook, with encouragement from Great Britain and from Germany, the construction of the Hindīya barrage and the Habbānīya escape of which only the former was completed in 1914.

At the beginning of the Occupation, the interest of the military authorities in irrigation and in agriculture had been confined to restricting the former where it hindered navigation, and encouraging the latter to meet the needs of the troops, although a certain amount of flood prevention work was undertaken from late 1915 onwards. Urgent repairs of the Hindīya barrage and the completion of its canal were also carried out by military engineers in June, 1917, but not until a shortage of local food supplies for the army and later for the civil population was threatened,[2] was the extension of agriculture by means of irrigation taken seriously in hand through the Agricultural Development Scheme, put forward by Mr. C. C. Garbett, First Revenue Officer, July, 1917.[3] 'The plan was to complete canals left half finished by the Turks, dig new ones, improve old ones, to import and advance to the cultivators plough-cattle and seeds'.[4]

The Scheme was only partially successful, the new acreage brought under cultivation, 319,152 acres, being only a little more than half of the original estimate of 606,000 acres.[5] It had been calculated that 280,000 tons of grain would be produced.[6] Actually between 50,000 and 60,000 tons for the

[1] Sir William Willcock's estimate for his programme was £T29,105,020 or about £26,537,000. He anticipated the return would be about nine per cent. *The Irrigation of Mesopotamia* (1917, 2nd. ed.), p. 52.

[2] *Revenue Report*, 1918, p. 2; Hewitt, Sir J. P., *Report for the Army Council on Mesopotamia* (1919), pp. 4, 6, 9.

[3] See minutes of Conference, August 10th, 1917, which formally proposed Scheme. Hewitt, op. cit. App. 5, p. 44. The War Office approved of the Scheme on September 16th, 1917; ibid., p. 5. See also *Revenue Report*, 1917, p. 28.

[4] Ibid., p. 3.

[5] *Brief Note on Irrigation Works in Mesopotamia to November*, 1918, pp. 3-4, 7.

[6] *Final Report of the Agricultural Development Scheme* (Baghdad, 1920), p. 3.

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army,[1] besides supplies for the civil population were obtained. More valuable than the actual amount of the supplies and the consequent reduction of prices and economy of shipping were the political effects of averting a threatened famine, of the show of encouragement to agriculture and the hold acquired over the shaikhs and the tribes of the regions opened up by the Scheme.[2]

The Irrigation Department was taken over by the Civil Administration, April 1st, 1919.[3] The Acting High Commissioner, envisaging, no doubt, a long period of British control, advocated immediate caution and retrenchment. He recommended concentration of 'attention on securing and improving already existing systems where necessary' on the grounds that 'shortage of labour alike for construction and cultivation and financial stringency makes it impractical and inexpedient to open up considerable fresh areas for cultivation'.[4] The arguments of the Acting Civil Commissioner as well as the 'small and unambitious programme of minor works'[5] evolved under his direction and centring about the gradual establishment of the natural regime of the rivers,[6] were, no doubt, believed to be in accordance with the needs of the moment. Colonel R. G. Garrow, Officiating Director of Irrigation, had estimated that the existing population could cultivate approximately 1,500,000 acres of which approximately 1,320,000 acres were to be in cultivation by the end of 1919.[7]

Nevertheless, the policy as enunciated and the programme as

[1] Hewitt, op. cit., p. 13, gives 56,472 tons. See also *Review C. Admin.*, 1914-1920, p. 80; *Revenue Report*, 1918, pp. 2-3.

[2] *Final Report*, p. 1; *Revenue Report*, 1918, p. 2; Hewitt, op. cit., p. 9.

[3] *Irrigation Directorate, M. E. F., Admin. Report for period 1st April to 31st December*, 1919 (Baghdad, 1920), p. 4.

[4] Memorandum, A.C.C. to D.Q.M.G., Baghdad, December 27th, 1918. Also *Draft Report Covering the Last Ten Years of the Work of the Irrigation Department, 'Iraq, dated Baghdad, 14 May*, 1931, para. 3 (hereafter, *Draft Report*, 1920-30).

[5] *Irrigation Directorate, Admin. Report*, 1919, p. 2.

[6] Memorandum, Col. R. G. Garrow to D.Q.M.G., Baghdad, in *Correspondence Regarding Post-War Irrigation Policy in Mesopotamia*, 1919 (Baghdad, 1919), p. 9. Also, *Handbook of Mesopotamia*, p. 171.

[7] *Correspondence*, p. 2.

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evolved for one of the most essential departments of government for the country was unfortunate. They set up standards for works and expenditure which were to extend over into the Anglo-Arab regime.[1] They gave little or no encouragement to the department as constituted under that regime and tended to create a *non-possumus* attitude which was to add to the inherent difficulties of development of the country along progressive lines.

Out of the military Agricultural Development Scheme and the Directorate of Agriculture established in connection with it,[2] also grew the Agricultural Department of the Civil Administration which took over from the Deputy Quarter-Master General on March 1st, 1919.[3] Until late 1920, the functions of the Department were threefold: the improvement of Agriculture by scientific research, demonstration and education; the supplying of seeds and advice to military units in connection with vegetables and fodder production; and the administration of the Military Farms Department[4] attached to the Expeditionary Force.[5]

The prospect of developing Mesopotamia as a cotton-growing country had from the first attracted the attention of India, which apparently had hopes that Mesopotamia might provide a possible outlet for her surplus population,[6] and of the British Cotton Growers Association, which anticipated that it would become an additional source of supply of Empire cotton. A cotton expert, Captain Roger Thomas, was engaged;[7] a cotton

[1] The actual expenditure of the Department in 1919-20 was 8·4 per cent of the total, while in succeeding years the proportions to total expenditure were: 1921, 6·2 per cent; 1922, 7·1 per cent; 1923, 7·65 per cent; 1924, 6·26 per cent; 1925, 3·78 per cent; 1926, 5·35 per cent; 1927, 5·49 per cent; 1928, 5·27 per cent; 1929, 6·97 per cent; 1930, 4·07 per cent; 1931, 3·25 per cent.

[2] General Routine Order No. 820, July 30th, 1918.

[3] *Admin. Report Agricultural Directorate*, 1919 (Baghdad, 1920), p. 1.

[4] *Report Local Resources Depart.*, 1918, pp. 7, 9, 11.

[5] *Note on Organization of Civil Admin.*, 1 *September*, 1919, p. 2.

[6] Andrews, C. F., *Foreign Affairs*, April, 1930, p. 441; *infra*, p. 149.

[7] At the suggestion of the Trade Commissioners, Messrs. R. E. Holland and J. H. White, in their report, June 16th, 1917, *The Prospects of British Trade in Mesopotamia and the Persian Gulf* (Delhi, 1917), (confidential). They pointed out that in view of the prospective importance of Mesopotamia as a cotton growing area, an expert should be appointed to conduct tests with Egyptian, American and Indian seed.

6:Ireland S-5 (no date)1937 MH1 Iraq MH1

175* 727* 241 farm at Karrāda, near Baghdad, and other experimental plots established in the country. Captain Thomas made comprehensive experiments,[1] both in the growing of cotton and in the marketing of the product, which seemed to hold out bright prospects for the future of Mesopotamia as a cotton-growing country.[2]

The activities of the Department centred about this and other experimental work,[3] but attempts were also made to encourage better agricultural methods, both by the dissemination of information and by the demonstration of modern machinery.[4] The handicaps, however, of the long years of ignorance and of dependence on traditional methods, the consequent apathy of the actual cultivators, the lack of education, the weather vagaries, the uncertainty of water supplies and the uncontrolled pests as well as the scarcity of funds available hampered the Department on every side. Under such conditions, the pioneering activities of the Department, often discouraging in the lack of apparent results, laid the foundations of service which might have played a greater part in regenerating the country had its early efforts been maintained during the succeeding years.

Education

175* 871 Under the Turkish Government, an excellent system of education, according to its own reports, existed for 'Iraq, with a

[1] Thomas, R., *Possibilities of Mesopotamia as a Cotton Growing Country, Note I, June* 15, 1918 (Baghdad, 1918); *Note II, January* 15, 1919 (Baghdad, 1919); *Note III, November* 5, 1919 (Baghdad, 1919); *Report on Cotton Experimentation Work in Mesopotamia*, 1918 (Baghdad, 1919); Ibid., 1918-19, (Baghdad, 1920); *Report of Deputation to England* (Baghdad, 1919). Also, Philby, H. St. J. B., *Cultivation of Cotton in Mesopotamia* (Baghdad, 1919).

[2] Thomas, R., *Note III*, 1919, p. 10. Also, *Baghdad Times*, April 14, 1923.

[3] Results of the early studies of dates were embodied in Dowson, H. V., *Dates and Date Cultivation* (Cambridge, 1924); experiments with wheat in Garbett, C. C., *Note on Wheat Experiments, Mesopotamia*, 1917-18 (Baghdad, 1918) and those of other experiments in leaflets published by the Department.

[4] Most of the technical staff, both gazetted and non-gazetted, of the Department came from India as did most of the experimental equipment. *Admin. Report of the Department of Agriculture in Mesopotamia*, 1920 (Baghdad, 1921), pp. 2-3.

6:Ireland S-5 (no date)1937 MHI Iraq MHI

cases are still rampant and infant mortality is distressingly high.

In agriculture the wave of optimism of the early 1920's has ebbed away. The Agricultural School at Rustam has been curtailed in funds, in purpose and in function. Improved machinery and agricultural methods foreshadowed during the British Occupation have not been introduced generally and are still regarded with disfavour in many quarters. Cotton, once believed to be the crop in which 'Iraq would rival the Sudan and India has been rendered unprofitable by boll-weevil, by hot winds, by the reluctance of the *fallahīn* to cultivate a strange crop which does not provide a living for themselves as it grows, and by the drastic fall in world prices. Wheat and barley remain of low quality, the foreign market being practically lost. Improvement in packing and marketing dates, 'Iraq's principal crop, has been apparent but effective co-operation among the growers is still lacking. Cheering features, however, have been the negotiations whereby Japan may take 'Iraqī wool and the signature of an agreement between 'Iraq and Palestine, December 14th, 1936, granting 'Iraq a free zone at Haifa and numerous commercial concessions.[1] The favourable trade balance of £217,000 for 1934-35, recently announced by the Ministry of Finance, is also encouraging.[2]

Large-scale industries are, for the present, practically non-existent although a number of projects, such as cement making, have been under consideration for some time. The Department of Labour Affairs, necessitated by 'Iraq's entrance into the League of Nations has had few important matters to come into its hands, although a law protecting 'Iraqī labour against foreign competition has been recently passed.[3]

These brief summaries of tendencies apparent in the political, economic and social life of 'Iraq seem to indicate, on the basis of absolute standards, the development of 'Iraq along unsatisfactory lines. It is only fair, however, in judging a government

[1] *G.B. and E.*, March 11th, 1937. [2] *Al-'Iraq*, September 7th, 1936.
[3] *G.B. and E.*, December 26th, 1935.

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I. Introduction

Iraq possesses impressive potentialities for economic development. With a total population of about 5,000,000 and an area of 168,400 square miles, Iraq is sparsely populated in relation to its resources. Although all but a relatively narrow belt in the north and northeast has insufficient rainfall to sustain agriculture, the country's twin river systems—the Tigris and Euphrates—can provide large amounts of water for irrigation. Much of its soil is inherently fertile and with ample water, manpower and implements, the area under cultivation might be almost tripled. In oil, Iraq possesses not only a source of foreign exchange but also a cheap source of power and raw materials essential to the development of industry, agriculture and transportation; and it may have other mineral resources susceptible of commercial exploitation. There is little doubt that the country can ultimately maintain a much larger population on a considerably higher standard of living.

As yet, however, this economic potential is in sharp contrast to the poverty prevailing in Iraq. The standard of living of the people is extremely low. Income per capita is probably at most ID 30.[1] Almost 90 percent of the population are illiterate and many are subject to debilitating diseases such as malaria, hookworm and bilharzia. Housing and sanitation are for the most part primitive. The fundamental reasons for these conditions are low output and low productivity. Most of the manpower on the land is underemployed for a large part of the year, and considerable unemployment exists in the major cities. Vast tracts of land await reclamation and irrigation before they can be used. Much of the available water is wasted owing to lack of storage and regulation of flow. In the spring disastrous floods often inundate large areas; and in the fall water is acutely short. Agricultural output is hampered not only by the inadequate and irregular supply of water, but also by the progressive salination of the soil in the irrigated areas. Agricultural techniques are primitive, the number and quality of draft animals are inadequate and there is insufficient equipment. Industry is little developed. Although perhaps as many

[1] One Iraqi dinar equals £1 or $2.80.

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cal resources of other countries. It will be noted throughout this report that the Mission has made numerous recommendations for the procurement of foreign technical assistance. These recommendations are in no sense a disparagement of the talent and skills now available in Iraq. They represent rather a recognition that a country whose development has been severely handicapped by limited financial resources in the past cannot now suddenly expect to launch a development program involving rapid expansion in virtually every field without availing itself of the many opportunities to obtain technical help from abroad.

II. Agriculture

Any development program for Iraq must obviously put primary emphasis on agriculture. Over 60 percent of the population is engaged in agriculture, and both industry and commerce depend in turn largely upon farming and animal husbandry. Moreover, large increases in output can be realized both by raising the productivity of livestock and farm land already in use and by bringing under cultivation large areas presently idle.

Existing Conditions

Agriculture in Iraq is devoted largely to the cultivation of winter crops. Because of the lack of rain in the summer, during that season crops can be grown only under irrigation. In the rain-fed zone of the North, summer crops can be grown only on a moderate scale in small irrigated areas. In the irrigated zone of central and southern Iraq the limited water supply restricts the area devoted to summer crops to only about one quarter of that grown to winter crops. Barley and wheat are the only significant winter crops, while rice and, more recently, cotton are the principal summer crops. The area sown to sesame, corn, millet and grain sorghum is comparatively insignificant. Tobacco assumes some importance in the mountainous areas of the North. Fruit and vegetables are quite important. Iraq is the world's principal producer and exporter of dates; excellent citrus fruit is grown, particularly in the Diyala Valley in east-central Iraq, for domestic con-

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sumption; and other fruits and nuts are cultivated, mainly in the North.

Livestock raising is an adjunct to agriculture rather than an integral part of it. Sheep and goats predominate because they thrive despite poor grazing and feeding. Sheep and goats, as well as camels, are kept primarily by pastoral nomads who probably number well over 200,000. Cattle and water buffaloes are the livestock of the settled agricultural population. Many peasants, however, have no livestock at all except for a draft animal or two. Livestock are left to forage for themselves, with only some supplementary feeding with straw and perhaps barley in the winter. Only livestock in and around the cities are systematically fed.

Crop yields are generally low. The water supply is frequently inadaquate. Agricultural methods have on the whole remained unchanged for centuries. Little or no animal manure or fertilizer is applied to the soil, animal dung being used largely for fuel. Crop rotation is wholly inadequate and makes little or no provision for soil-building crops. Salinity, attributable to poor drainage, has materially lowered the productivity of land in the irrigation zone. Owing to insufficient and poor draft animals and lack of proper equipment, the soil is often poorly prepared, and weeds detract from the yields. Up to half of the winter crop area is left fallow as a means of restoring fertility, but since the land is generally allowed to go up in weeds to afford grazing for animals, the efficacy of the fallow system is limited. The productivity of livestock is also low, primarily because of inadequate feeding, but also because of poor breeding, disease and insufficient shelter.

Except for some rather limited areas in various parts of Iraq and a promising settlement in the Dujaila district of south-central Iraq, the country is almost wholly devoid of peasant proprietors. The ownership of cultivated lands is largely in the hands of sheikhs and urban proprietors who entrust the actual cultivation in small parcels to sharecroppers. These sharecroppers have neither the equipment nor the knowledge to increase production and for the most part eke out a bare subsistence.[2] The land assigned to the

[2] According to the cadastral survey which is half completed, 67.1 percent of the privately-owned land is in units exceeding 1,000 donums. (One donum equals 0.25 hectares or 0.617761 acres.)

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fellah or peasant generally changes from year to year so that the cultivator has virtually no incentive to improve it. Moreover, the sharecropping system discourages the cultivation of animal fodder crops since the customary apportionment of shares between landlord and tenant does not lend itself readily to such crops. Most of the landowners themselves show little interest in improving agriculture. Enjoying a large share of the crop with the expenditure of little or no effort on their part, they have little incentive to raise output. In recent years, however, an increasing number of landlords have been displaying a direct interest in improving crops and diversifying production. Some of them have been instrumental in raising production by installing pumps for irrigation, introducing new and more remunerative crops such as cotton, and investing in agricultural machinery.

The depressed economic condition of the fellah or sharecropper undoubtedly retards progress. It undermines the health and vigor of the rural population, limits the market for industrial products and may in the long run jeopardize the stability of the social order. The sharecropper's plight is attributable both to his poor economic bargaining position and to the low productivity of agriculture. In the irrigation zone the fellah generally gets only half of the crop even though the state has provided the irrigation works; and his share falls substantially below this percentage whenever the land is irrigated by privately-owned pumps or the landlord supplies seed, draft animals or machinery. In a country where capital is scarce in relation to manpower, the ability to provide the means of production—land, seed, animals and machinery—almost invariably also carries with it the ability to exact a high proportion of the return. In Iraq this is reinforced by a law which forbids the sharecropper to leave the land as long as he is indebted to his landlord, which is generally the case. In the long run the sharecropping system could be made quite tolerable if the productivity of the land were raised; and the economic bargaining power of the sharecropper could be increased by giving him access to the means of production—seeds, animals and implements—on more favorable terms through such institutions as cooperatives. In the shorter run, however, the sharecropper's position is likely to improve only as the landowner takes steps to improve his lot in order to keep him

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on the land. There is apt to be increasing pressure on the landowner to take such steps as a result of the growing opportunities for alternative employment created by a large increase in public expenditures on development, the expansion of industry and the opening of state lands to settlement. In fact, unless the sharecropper's status is improved, there is a great danger that there will be a continued flight of labor from the land, impairing the country's agricultural production.

The government itself has made only a modest contribution to the advancement of agriculture. The Directorate-General of Agriculture is only a subordinate department in the Ministry of Economics and has been severely handicapped by lack of funds and a shortage of competent agricultural officers. While it has had some success in combatting pests and diseases and in the extension of such crops as cotton and citrus fruit, too little attention has been devoted to practical research, and almost no field work has been carried out to assist cultivators in improving their crops and methods of cultivation. The expenditures of the Agriculture and Veterinary Departments were actually cut from ID 1,160,000 in 1948-49 to ID 540,000 in 1950-51 and, at the latter figure, represented only 1.8 percent of the total budget outlay. Expenditures on both agriculture and irrigation 1950-51 amounted to only 6.7 percent of the total.

Plans for the future now envisage large water storage and irrigation projects to provide more water for land already in use and to increase the area under cultivation and provide for the settlement of new land. These plans are in general quite sound. They will be largely ineffective, however, unless at the same time more stress is placed on arresting the deterioration of land already in use by extensive drainage schemes and on raising the productivity of agriculture by other means. The establishment of an efficient extension service and the provision of incentives to improve methods of cultivation are particularly important in this connection.

Expansion of Area under Cultivation: Irrigation

Extension of the area of land under cultivation is vitally important not only to an increase in production, but, above all, as

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number of factors including (1) the cost and the technical aspects of the irrigation works, (2) the agricultural potentialities of the land affected, (3) the location of the land in relation to the availability of potential settlers, and (4) the ownership of the land. The first three of these need no elaboration. The fourth is important primarily because, provided adequate consideration is given to the first three factors, it would presumably be desirable to give priority to the irrigation of those lands which are clearly part of the state domain and which therefore would be available for distribution to small-holders.

Before laying out new irrigation projects the basic premises on which such projects have been designed in the past should, we suggest, be re-examined. Hitherto such projects have been laid out on the assumption that half of the area devoted to the cultivation of winter crops would lie fallow annually. The area in summer crops has not been considered since, in the absence of water storage facilities, the amount of water available limited the area that could be devoted to summer cultivation to about 15 to 20 percent of that in winter crops. The fallow system was regarded as necessary to permit the soil to rest and recover its fertility and to enable the land to dry out and the water table to sink, thus minimizing to some extent the danger of salinity. In the future the government will have the opportunity, through organized settlement and development of the new land, to prescribe the use of better systems of crop rotation which will more effectively maintain soil fertility; and the simultaneous installation of drainage facilities, now universally acknowledged to be essential, will prevent salination. At the same time the completion of the large storage projects will presumably permit some control over the distribution of water for winter crops on the one hand and summer crops on the other. Thus it will be desirable to determine, within the limits of flexibility set by the available water supply, the proportion of winter to summer crops which promises the largest overall yield, having regard both to improved crop rotation and to better utilization of manpower on the land. Such a reexamination of the premises on which irrigation projects have been designed in the past may lead to the conclusion that the area to be covered by irrigation canals using a given quantity of water can in future planning be reduced.

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Greater attention should also be paid to measures which would insure more economical use of available water, thereby making possible a further expansion of the area under cultivation in the irrigation zone. Among these are the installation of regulators on the Gharraf canal, for which provision has already been made in the Development Board's program, and more effective regulation of the lower reaches of the Tigris and Euphrates to prevent the dissipation of water into the extensive marshes in the South. Leaks from canals, which are sometimes quite substantial, should be reduced to a minimum, if necessary by lining certain sections of the canals. Above all, the wasteful use of water in irrigation should be arrested. The amount of water used for each crop in Iraq is generally much greater than that in the irrigated areas of other countries. At present, water is used lavishly over wide areas in an effort to wash accumulating salt from the roots of crops. In the end this only accelerates the progressive salination by raising the water table which brings up and precipitates the salt. The installation of drainage facilities which will lower the water table will therefore be the most effective means of preventing wastage of water. There is also an urgent need, however, to ascertain through practical experimentation, carried out under the joint technical supervision of agricultural and irrigation experts, the optimum amount of water required for each crop and to disseminate these findings among the cultivators.

The completion of the water storage facilities and irrigation works mentioned above will undoubtedly create some problems of adjustment. In a few places pump-irrigated lands will have to be abandoned as the consequence of new flow-irrigation schemes, and the people affected will require resettlement. In an area of about 750,000 donums the natural flooding of rice lands practised in some districts will presumably no longer be possible, and new methods of rice culture will need to be introduced. Rice patches will have to be terraced to permit the progressive flow of water from one terrace to the next and fertilizers used in the place of silt to replenish the soil; alternatively, new crops may have to be introduced. In some cases, partial resettlement of the people affected may need to take place. Even under existing conditions, however, problems of readjustment arise. Natural inundation, for example,

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has led to the progressive silting and raising of rice lands, thereby pushing rice culture deeper into the marshes.

Finally, the Mission wishes to emphasize the importance of improved operation and maintenance of existing irrigation works. To insure proper functioning of the irrigation system the canals must be equipped with an adequate system of regulator intakes and distributors. Rational distribution of water is often impeded by ancient water rights which insure some landowners a disproportionately large share. In times of scarcity the apportionment of water is often hotly disputed and subject to favoritism. The right of access to water across the lands of other farmers is inadequately insured. A sufficient number of adequately compensated irrigation officials of acknowledged probity is necessary to a fair distribution of water. They should be assisted by local councils of farmers who would gradually learn to approach the problem of equitable distribution in a cooperative spirit.

Lack of maintenance has been a serious problem in the past. To facilitate maintenance, irrigation systems should be equipped from the very beginning with such works as roads along canals, canal crossings for people and livestock, water-holes and washing places. To insure adequate operation and maintenance in the future, the Mission recommends that the annual budget of the Irrigation Department, which has averaged only ID 270,000 over the last ten years, should be increased progressively to about ID 1,000,000. The technical supervisory and planning staff also needs to be strengthened

The Rain-fed Zone

Except for some areas west-northwest of Kirkuk and the possibility of ultimately irrigating part of the Erbil plain with the water stored behind the Bekhme dam, large-scale irrigation schemes for the North do not appear feasible. Lack of suitable dam sites and topographical difficulties militate against such schemes. Smaller projects, utilizing the water of small streams, springs or wells are possible, however, and these should not be neglected in favor of the more striking, larger schemes. In many parts small streams and springs are already being used, but with direction and stimulus provided by the government these could be improved and many

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The Mission believes that the settlers should, as a matter of general principle, be required to make some payment for the extensive benefits received. This is all the more necessary in order not to widen unduly the disparity between the economic status of the favored settlers and that of the great majority of cultivators who will continue to work under much less favorable conditions. Such payments need not be excessively burdensome, since they could be spread over a number of years.

The new law will apply on a broad scale the basic principles of the Dujaila land settlement scheme in south-central Iraq. In the period 1946 to 1950, 1,058 farmers were settled there on 100-donum plots allotted from state-owned irrigated land. The Mission was impressed by the results achieved through this scheme. The farmers, who used to be sharecroppers, are conscious of their new-won independence and dignity. By comparison with the fellahin in neighboring areas they appear prosperous and content. Many of them are members of a cooperative—the only one of its kind in Iraq—which owns 10 tractors, two lorries, a flour mill and a club-house. Although the accounts of this cooperative leave much to be desired, its operations are generally along sound lines and indicative of what can be accomplished through state-assisted self-help. The Dujaila scheme is, however, not without defects. Its success as an agricultural venture is jeopardized by the progressive salination of the land because of failure to provide drainage facilities —an omission which should be promptly remedied. The administrative staff appears to be excessively large. Small-scale "landlordism" has crept in, since some farmers have brought in others to do a large part of their work on a sharecropping basis. The farmers were settled in a scattered fashion without regard to the need for community life. Most important, aside from insisting on small fruit gardens, the committee in charge of the project has effected no improvement in farming methods. The Department of Agriculture is not even represented on the committee, and there are no agricultural experts in the project capable of assisting farmers in raising their standards of cultivation. The improved economic position of the cultivators in the Dujaila scheme is almost wholly due to the fact that the farmer there has a larger plot of land and does not need to surrender a share of his output to a landlord. In the

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new settlements the government will have a unique opportunity to remedy the shortcomings of the Dujaila project.

Improvement in Productivity

While expansion of land under cultivation, particularly through large irrigation schemes, is essential in the long run to provide for a growing population and to establish a socially desirable class of smallholders, it should not be undertaken without a simultaneous vigorous campaign to increase the productivity of agriculture and livestock. The temptation to neglect such an effort in favor of striking new irrigation schemes should be resisted. Among the measures upon which this campaign should concentrate are drainage, the provision of better tools, seeds and draft animals, the introduction of soil-building and forage crops, the use of fertilizers, the improvement of livestock, the planting of trees and the establishment of an effective extension or advisory service to farmers.

1. Drainage

The drainage of existing irrigated lands would make the most important single contribution to increasing the productivity of agriculture. Moreover, it will also have the most immediate effect since it can be carried out by the government while the success of virtually all other measures to raise productivity depends on the necessarily slow process of persuading farmers to abandon age-old methods of cultivation.

The Haigh Irrigation Commission, which made an extensive study of irrigation and flood control for the government, estimated a few years ago that about 60 percent of the land irrigated by flow had been seriously affected by salt. The Mission's own inquiries and observations indicate that as much as 20 to 30 percent of cultivated land has been abandoned over the last few decades because of salt accumulation, while on a large part of the remaining land yields have declined by 20 to 50 percent and even more. In a number of new irrigation projects such as Hawija and Dujaila salting forced abandonment of part of the land within two years after the schemes were initiated. Drainage, almost totally neglected in the past, should therefore be prosecuted with utmost vigor in the future.

The main drainage canals for the whole irrigation zone have been projected, but it is now necessary to proceed with detailed

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312 planning and execution. First priority should be given to the drainage of the areas irrigated by the canals dependent on the Hindiya barrage on the Euphrates. A complete drainage network should be laid out as soon as possible for the Aggar Qub region, where drainage studies have already been carried out, in order to determine through practical experimentation the most appropriate design and spacing of the subsidiary drainage canals. Prompt attention should also be given to the drainage of the Dujaila area in order to halt the rapid deterioration of the land which may otherwise endanger the success of this important social experiment. Altogether the Mission believes that about ID 7,000,000 should be allotted to drainage over the next five years. This compares with a sum of ID 2,000,000 provided in the initial five-year program of the Development Board. So important is drainage that the Mission recommends that it be given priority over new irrigation schemes whenever a limitation of resources makes it impossible to carry out both simultaneously.

Since landowners will benefit greatly from drainage, they might reasonably be required to pay at least some part of the cost. Consideration might therefore be given to the imposition of a levy to pay the cost of subsidiary drainage canals. Construction of such subsidiary canals should not be optional with the landowners because failure to build them across one man's property might deny the benefits of drainage to adjoining properties.

2. Tools and Draft Animals

241 In the recent past much stress has been placed in Iraq on agricultural mechanization. In large parts of the country, particularly in the dry-farming zone, natural conditions are undoubtedly favorable to the use of tractors. The use of threshing machines or combines has also been shown to have the advantage of producing a far cleaner grain than that obtained through the customary method of threshing by flaying and the tramping of animals. For a long time to come, however, the great majority of Iraqi farmers will be unable to afford the purchase or rental of power machinery even on deferred payment; and many others will find mechanized farming unprofitable particularly as long as the cost of machinery remains so high in relation to the cost of labor. For most farmers the provision of simple tools as well as more and better draft ani-

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mals offers a more practical answer to their needs at this time. Experience in Iraq shows that tractor plowing may increase yields by 20 to 50 percent, largely through more effective destruction of weeds and partly also through better preparation of the soil. Much the same effect could, however, be achieved through better animal-drawn plows replacing those which now, for the most part, barely scratch the surface and fail to uproot the weeds. Means for the acquisition of such tools and improved draft animals should be created through the organization of cooperatives and the provision of better credit facilities.

Mechanization will nevertheless play an increasingly important role in the future, especially as labor becomes more scarce and additional land becomes available for cultivation. Mechanization has already facilitated the expansion of cultivation in the dry-farming areas of Mosul and the new pump-irrigated lands in central Iraq. While certain areas in the irrigation zone are undoubtedly overpopulated in relation to land currently available, in other areas, particularly in the rain-fed zone, labor is scarce relative to the supply of land. As development schemes are launched and new land is opened up for settlement, the available manpower on lands already under cultivation may well be reduced. The government will need therefore to take steps to insure that mechanization will keep pace with developing requirements. In the period immediately ahead, however, the government should be mindful of the possibility that mechanization initiated by landowners may result in a substantial reduction of the portion of the crop going to sharecroppers or in the displacement of sharecroppers before alternative means of employment or settlement become available. Through its control over the importation and distribution of machinery and the extension of credit for the purchase of such machinery, the government will have the power to influence the direction of mechanization and thus minimize to some extent possibly adverse social consequences.

At present only a small portion of Iraqi agriculture is mechanized. Combines and tractors in operation are reported to number 320 and 750 respectively, with about half of the number concentrated in the provinces of Mosul and Baghdad. Of these, 75 combines and 81 tractors are owned by the Agricultural Machinery

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to machinery. In the future cooperative ownership and operation, especially in the new settlement areas, should be encouraged as one of the best means of extending the use of machinery on a practicable and economical basis. The experience of the Dujaila cooperative, which, owing to low overhead and transport costs, rents machinery to its members at rates lower than those of the AMA and yet is apparently able to cover the cost of depreciation, seems promising in this respect.

Lack of repair facilities and spare parts have greatly handicapped mechanization. The government is seeking to overcome this difficulty both by establishing its own repair shops and by requiring importers to provide repair facilities and maintain minimum stocks of spare parts. Such centrally located shops will be available, however, only for major repairs. Since local repair facilities are now almost wholly lacking, steps should also be taken to establish a considerable number of small shops equipped to undertake minor repairs. In addition, courses designed to train drivers in elementary maintenance are urgently needed. The cost of mechanization will remain discouragingly high unless the life of machinery is prolonged by more adequate maintenance and repair.

3. Soil-building and Forage Crops: Fertilizers

The cultivation of soil-building and forage crops is virtually unknown even though the fertility of the soil needs to be replenished and an improvement in feed supply would make the greatest single contribution to an increase in the low productivity of livestock. In the irrigation zone berseem clover, sown in the grain stubble in late summer, would provide a particularly good pasture, soiling and hay crop. In the rain-fed region winter oats and vetch, when cut and cured, would provide a good reserve feed. In the irrigation zone quick-growing crops such as millet could be grown for summer pasture; and more corn, sorghum and legumes such as cowpeas and mungo beans should be cultivated.

Little fertilizer is used and animal manure is generally collected and dried for use as fuel. With the expanding cultivation of crops such as cotton, the use of fertilizer is becoming more urgent. There is need for soil analysis and extensive experimentation to ascertain the fertilizer requirement and the effect of fertilizer on

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241 [387] yields. As will be indicated later, inorganic fertilizers could probably be produced cheaply in Iraq and organic fertilizers could be produced as by-products of the slaughtering industry.

231 4. Livestock Improvement

The productivity of livestock is extremely low, primarily because of inadequate feed supply. In addition to the production of fodder crops, measures should be taken to improve natural pasture lands, particularly in the northern mountains, which have generally suffered from over-grazing. Reseeding and rotational grazing are necessary. Productivity could be further raised by the establishment of shelters, better breeding methods, especially the introduction of new and improved sires and maintenance of stud stations, and by more effective control of parasitic diseases through an increase in the number of veterinarians and the provision of more extensive diagnostic facilities in the provinces.

The quality of livestock products could be raised considerably by a number of measures. One of these is an improvement in the practices and more stringent sanitary supervision of abattoirs. Others would be the establishment of a number of wool shearing and grading units under the guidance of an appropriate expert; appointment of a hides and skins expert to serve as general manager of the newly established Hides and Skins Association; and recruitment of an abattoir specialist to train local abattoir supervisors in improved methods of flaying and preserving hides and skins.

234 At present, even the major cities are without a clean, safe milk supply. The supply of milk could be substantially improved by better feeding of livestock, concentration of milking cattle in well-equipped settlements on the outskirts of cities, and central collection, transportation and processing of milk under strict sanitary controls. The possibility of cooperative collection and processing of milk should be explored.

231 [233] Since the nomads and semi-nomads, who may number from 200,000 to 500,000, account for a large proportion of the livestock in the country, particularly sheep and goats, their needs must receive special attention. Measures should be taken, for instance, to provide them with better watering facilities, sheep-dipping stations,

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the only remedy available were a more equitable division of income. Fortunately, the future does afford the promise of a large increase in national income as a whole. The country has the natural resources—land, water and oil—which can bring a much higher standard of living to all. The revenues from oil will provide the means for a potentially rapid development of other productive resources. The central objective must be the attainment of a much higher output in a manner that will benefit the people as a whole.

In a country like Iraq principal emphasis will inevitably need to be placed on the development of agriculture. For this reason schemes for the storage of the flood waters of the Euphrates and the Tigris will be of key importance. They will prevent disastrous floods and control the flow of the rivers so as to bring more water to deficient areas and open up large new areas for settlement by land-hungry peasants. An increase in production, however, will not come simply from an expansion of the area under cultivation. The time will come when further expansion will not be possible except at great cost. This makes it all the more necessary to raise the present low productivity of agriculture. The drainage of lands which have deteriorated owing to salting has accordingly been emphasized by the Mission as one of the first objectives. Great importance is also attached to the early development of an adequate agricultural extension service, supported by an effective practical experimental organization, which would work directly with farmers in improving their methods of production. Other measures recommended to this end include the provision of incentives to use fertilizers and to cultivate soil-building and fodder crops, and the organization of cooperatives and more ample credit facilities so that farmers can have easier access to improved means of production—better plows and draft animals, other agricultural machinery, seeds and fertilizers.

Industrial development can in many ways effectively complement agriculture. The proposed chemical plant at Kirkuk, supplemented by bonemeal plants, could provide the cheap fertilizers needed to raise the productivity of Iraqi agriculture. Expansion of cotton textile and vegetable oil extraction capacity would capitalize on the growing output of cotton. The proposed modern machine shop would cater to agriculture by reducing the cost of irrigation

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311 waters of the twin rivers are largely wasted and periodically unloosen disastrous floods upon Baghdad and the alluvial plain to the south.

The Rain-fed Zone

241 438 In the upland plains of the rain-fed zone stretching from Northern Mosul to Suleimaniya, wheat and barley are the principal crops. Rainfall is generally inadequate for summer crops, although water from streams and springs permit cultivation of rice and cotton. In part of this area, especially Northern Mosul, there has been a rapid extension of cultivation with the help of modern agricultural machinery.

233 438 241 To the north and northeast lie the mountain massifs of Iraq. Here the raising of cattle, sheep and goats by Kurdish nomads is one of the principal occupations. The mountains are largely barren of trees but offer natural pasture for animals. In the valleys and on hillsides grain, tobacco, timber and fruit are grown. Tobacco, although small in area, is an important cash crop.

438 433 [315] Except for some handicrafts, there is little native industry in this region. Mosul, the second largest city in Iraq, is principally a commercial center and an outlet for exports to Syria and Lebanon. Kirkuk, however, is the center of most of Iraq's petroleum production and one of the largest and richest oil fields in the world. Oil fields of subsidiary importance also exist at Ain Zaleh in Mosul province and near Khanaqin in Diyala province. The mountains of the North may ultimately yield other minerals such as copper, chrome and iron.

The Irrigation Zone

133 311 South of the rain-fed zone the river valleys may be divided into three major regions: the upper river valleys; the lower river valley down to Amara and Nasiriya; and the triangular area from Nasiriya and Amara to the mouth of the Shatt al Arab.

The first of these regions includes most of the northern Jezireh and the area north of Baghdad and east of the Tigris. The latter area still awaits irrigation for the most part, and the Jezireh is hardly susceptible to irrigation because of the elevation and configuration of the land. The Jezireh is an upland plateau

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relieved by low ranges and depressed areas of which the major one is the Wadi Tharthar. It is sparsely inhabited by pastoral nomads although in the North some settled farming, made speculative by irregular rainfall, is carried on.

The second region, extending downstream from Ramadi on the Euphrates and Baghdad on the Tigris and including the Diyala River Valley, is the area where most irrigation projects have been carried out in the past. Pump irrigation predominates on the banks of the three rivers where the land is high and water is easily accessible. For the more remote areas flow irrigation is provided by canals dependent on the Hindiya barrage on the Euphrates, the Kut barrage on the Tigris and the Diyala weir on the Diyala River. Here flow irrigation between the two main rivers is facilitated by the fact that in the Baghdad region the Euphrates is higher than the Tigris, while below Baghdad the Tigris is above the Euphrates. In this region barley is the principal winter crop, followed by wheat. Summer crops are limited by lack of water, but among them cotton has become in recent years by far the most prominent, leaving sorghum, sesame, green gram, corn and millet far behind. Fruit culture is important. Dates are widely grown, both for domestic consumption and for export; and the Diyala Valley in particular produces excellent citrus fruit. Rice is an important crop between Nejf and Diwaniya on the Euphrates and around Rumaitha farther down the river. The country's major concentration of population lies in the region comprising the district about Baghdad and the provinces of Hilla, Kerbela and parts of Kut and Diwaniya. It includes the capital, Baghdad, a city with a population of 550,000 and the leading commercial and industrial center of the country.

The third region—the Basra, Nasiriya, Amara triangle—is generally one vast marsh during the spring floods. Here the rural dwellings are of reeds and brushwood, in contrast to the rest of the country where mud huts and, in the mountains of the North, stone houses predominate. Rice grown in the naturally inundated marshland is the staple food, varied by fish; and the water buffalo is the prevailing type of livestock. Here also is the world's largest date palm belt stretching along both sides of the Shatt al Arab and contributing one of Iraq's principal exports. Basra, Iraq's only port, is the largest city of this region and handles most of the country's foreign trade.

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TABLE 2

CULTIVABLE LAND, CROPPED LAND AND LAND IN AGRICULTURE USE
(in millions of donums)

CULTIVABLE AREA		48.1
Irrigation zone	32.1	
Rain-fed zone	16.0	
AREA ACTUALLY IN CROPS		11.1
By area		
Irrigation zone	7.6	
Rain-fed zone	3.5	
By type of crop		
Winter	8.4	
Summer	1.9	
Orchards	0.8	
AREA UNDER CULTIVATION		17.5

These figures would indicate that the area under cultivation, taking into account the assumption that almost half of the area devoted to winter crops is normally left fallow, is only about 36 percent of the total cultivable area. In the rain-fed zone the area under cultivation could theoretically be more than doubled; and in the irrigation zone it could be almost tripled. Unquestionably these figures give a somewhat exaggerated impression for it is likely that the criteria employed in classifying land as cultivable have been rather liberal, but there is little doubt that the area under cultivation can be greatly extended. What would be required in detail to put this additional cultivable land in actual use is not known, but, in the irrigation zone, water and drainage are undoubtedly the prime prerequisites while, in the rain-fed zone, more manpower and machinery may be the principal requirements.

Forms of Land Tenure

Land is held under a complicated system of tenure which has given rise to much confusion and conflict. In accordance with traditional legal concepts the state has retained the ultimate legal title to nearly all the available land. Absolute private ownership, known as *mamloukah* or *mulk*, is confined to urban property and orchards. Rights to the permanent usufructuary possession of a large proportion of state or *miri* land have been acquired by private

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that the land was cultivated and a crop produced in any one year, and the land settlement officers, who have sometimes been inexperienced and subject to influence, have on occasion accepted even more tenuous evidence as proof of a prescriptive claim. In this way a large portion of state land has been alienated to sheikhs and other influential persons, and the number of large landowners has multiplied.

Distribution of Land

Complete data on the distribution of landholdings are not available. For the area covered by the cadastral survey, it is possible to classify private landholdings into various categories according to size. Such a classification, given in the accompanying table, shows that holdings of 1000 donums or less account for only 15.7 percent of the area. This is indicative of the small number of peasant proprietors. On the other hand, holdings of over 1,000 donums accounted for 67.1 percent of the total of privately owned land, while those of more than 10,000 donums comprised 24.3 percent of the area. Moreover, the importance of large holdings is undoubtedly underestimated by these figures. The cadastral survey has proceeded by areas known as *muqata'as*. In a number of cases landowners have holdings in several *muqata'as*, but these have been registered as separate holdings. Thus, according to the cadastral survey, there is only one holding in Kut in excess of 100,000 donums (namely 174,251 donums), although it is generally reported that there are actually several holdings well over 300,000 donums.

The accompanying table indicates that the highest proportion of small holdings is apparently in Basra, Dulaim, Kirkuk and Suleimaniya. The provinces of Kut, Amara, Mosul, Diyala and Kerbela have the highest percentage of large holdings.

The Sharecropping System

Although the amount of land cultivated directly by the landowner has increased since the last war with the use of modern machinery, particularly in Mosul and Baghdad provinces, the great bulk of the land is tilled for the landholder by peasants or fellahin against a share in the crop. The sharecropper is not a tenant in the sense that this word is generally used in the western world. He has no discretion in the use of the land and does not lease a

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specified piece of land for a definite period from the landholder against a fixed rental. The landholder or his agent *(sirkal)* assigns to the sharecropper each year the land to be cropped, determines the type and quantity of seed to be sown and prescribes the time and methods of plowing, watering, harvesting, etc. He generally makes an initial advance to the cultivator and often provides the fellah with seeds, draft animals and other means of production. Under the Law Governing the Rights and Duties of Cultivators enacted in 1933, the landholder has the power to keep the fellah on the land as long as the latter is indebted to him. Thus the fellah is in reality a laborer who works with his family not for a fixed wage, but for a share of the crop.

The portion of the crop retained by the fellah varies rather widely. In the northern rain-fed zone it is higher than in the southern irrigation zone. In flow-irrigated areas it is half or two fifths but drops to about one third when the landholder provides the seed. Although, under the law, the landholder is not allowed to charge interest on his advances to cultivators, his share of the crop when he provides the seed increases out of proportion to the cost of the seed he furnishes. When the land is pump-irrigated, the fellah's share is generally only two sevenths or three sevenths of the crop. In date and fruit groves where the landowner must make a heavy investment and the value of the output is high, the fellah may only get a fifth to an eighth of the crop. In the rain-fed zone the fellah usually retains 90 percent of the winter crop and even more if the land is relatively remote from the town or city. His share of summer crops which can only be grown with water furnished by the landowner may range from two thirds to one half provided he supplies his own seeds and implements. In general the fellah's share is larger in the North because manpower is less plentiful in relation to available land, yields tend to be lower owing to uncertain rainfall and the fellah frequently has long-established rights to the cultivation of his land.

The amount of land cultivated by each fellah and his family varies widely. In the irrigation zone the fellah may on the average plant about 20 donums of winter crops, and, owing to the shortage of water, perhaps 15 percent of this area in summer crops. In rice areas, he generally has only about four to five donums on the

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427 241 average; and in date and fruit groves his allotment is likely to be equally small. In each of these cases, however, the output per donum is considerably more valuable. In the rain-fed plains of the North where land is more plentiful and yields more uncertain, he may on the average plant as much as 40 donums in winter crops. In most areas the fellah and his family can probably get as large a winter crop area as they can till, but their capacity is limited by lack of draft animals, primitive agricultural techniques and the debilitating effects of disease and a hot climate. In some areas of the irrigation zone, however, particularly in parts of Hilla, Kerbela and Diwaniya, the fellah appears to get less land than he can till owing to the limited availability of good, irrigated land. The same applies to some rice-growing areas, particularly in Amara.

Lack of sufficient draft animals and implements, low yields and the necessity of turning over a share of the crop to the landlord or pump owner all combine to depress the economic status of the sharecropper. His position can only be improved by enabling him to raise his output or by increasing his bargaining power through the creation of alternative opportunities for employment and the opening up of new lands to settlement.

Minerals: Oil

135 315 Iraq possesses considerable mineral resources. Of these by far the most important is petroleum. There are at present two major oil fields—one near Kirkuk in the North, the other near Basra in the South. The Kirkuk field is generally reputed to have reserves of over 1,000 million tons, while that near Basra, which is less well explored, seems to be almost equally promising. There are also minor oil fields at Ain Zaleh in Mosul province and near Khanaqin on the Iranian border.

135 Although surface indications of the existence of copper, iron, chromite and other ores have been found in the mountainous belt adjoining Turkey and Iran, the existence of deposits of sufficient size to warrant commercial exploitation must first be confirmed by core drilling.

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V. Production

A considerable part of Iraq's potentially large resources are as yet unutilized or ineffectively utilized. Most of the manpower on the land is underemployed for a large part of the year, and considerable unemployment exists in the major cities. Vast tracts of land await reclamation and irrigation before they can be used. Much of the available water is wasted owing to lack of storage and regulation of flow. Oil reserves have as yet been tapped only in relatively modest quantities. The output of the country is therefore still very low and the standard of living correspondingly depressed.

Agriculture and Livestock

Estimates of the area and output of the principal crops are given in the table below. Although the statistics are not very reliable, they give some indication of the relative importance of the various crops. Barley and wheat are clearly the dominant crops. Barley is one of the leading exports, and cereals altogether accounted for 43 percent by value of the country's exports other than oil in the period 1948-50. Rice is another important cereal. Cotton is now vying with rice as the leading summer crop. Stimulated by high prices and government encouragement, the area planted to cotton has risen rapidly in recent years. In 1951, probably about 580,000 donums were put in cotton—almost five times the amount in the preceding year. Other summer crops are comparatively insignificant. Some sesame is grown for oil, and some corn, millet and grain sorghum. Tobacco assumes importance only in the mountainous area of the North. Virtually no crops are grown for animal fodder, and the production of hay is unknown. The area devoted to soil-building crops such as legumes is rather small.

Next to cereals, dates are the most important crop. There are about 20.2 million date trees, of which about 9.7 million are along the Shatt al Arab near Basra and the balance in the central valley districts of the Tigris and the Euphrates and the Diyala River Valley. Dates are a staple food over most of Iraq and date exports, particularly from the Basra area, contributed 31 percent by

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TABLE 5

Estimated Area and Production of Principal Crops

	Area (in 1000 donums)				Production (in 1000 metric tons)			
	1935-39 Average	1946-50 Average	1949	1950	1935-39 Average	1946-50 Average	1949	1950
Winter crops								
Barley	3200	4156	3814	4000	583	703	750	800
Wheat	2940	3686	3493	3800	541	375	450	520
Lentils	n.a.[1]	41	43	45	n.a.	5	5	6
Vetch	n.a.	28	34	35	n.a.	2	3	3
Linseed	n.a.	6	6	8	n.a.	0.2	0.3	0.2
Summer crops								
Rice	636	970	617	870	148	273	212	242
Cotton	84	55	43	130	2.5	7	6	25
Sesame	n.a.	153	176	75	n.a.	10	9	10
Vegetables	n.a.	n.a.	100	110	n.a.	n.a.	n.a.	n.a.
Corn	n.a.	106	61	130	150	16	10	21
Millet	n.a.	160	165	140	n.a.	13	18	19
Green gram	n.a.	86	111	70	n.a.	9	11	12
Tobacco	16	19[2]	15[2]	16[2]	5	4[3]	5[3]	3[3]
Dates	n.a.	750	750	750	300	275	170	250
Other fruits					n.a.	n.a.	n.a.	n.a.
Vegetables	n.a.	n.a.	100	110	n.a.	n.a.	n.a.	n.a.

[1] Not available
[2] Licensed area
[3] Purchases by the Tobacco Monopoly

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value of the country's total exports, other than oil, in the years 1948-1950. Citrus fruit, grown for domestic consumption, is of considerable importance in the Diyala River valley and substantial quantities of other fruits and nuts, although of rather poor quality and marketability, are grown in the North, especially in Sulei-maniya and Erbil. Vegetable culture is of particular importance in the neighborhood of large cities.

Agricultural yields are generally low, although most of the soil is inherently quite fertile. Barley yields, for instance, are about 30 to 35 percent less than those in Canada and the United States and probably slightly less than those of Turkey and Iran. Little or no animal manure or fertilizer is applied, animal dung being used largely for fuel. Salinity attributable to poor drainage has materially lowered productivity of land in the irrigation zone. The soil is often poorly prepared, and weeds detract from the yields. Chief reliance is placed on the fallow system to restore soil fertility, but, since fallow land is often allowed to go up in weeds on which animals graze, its efficacy is limited.

The raising of livestock is an important industry. Sheep and goats predominate because they thrive despite poor grazing and feeding.

TABLE 6

ESTIMATE OF LIVESTOCK POPULATION, 1949-50

Sheep	7,489,700
Goats	1,754,300
Cattle	1,034,600
Buffaloes	200,700
Camels	279,200
Horses	183,800
Mules	66,850
Donkeys	326,400

Sheep and goats, as well as camels, are kept primarily by pastoral nomads who probably number well over 200,000. Cattle and water buffaloes are the livestock of the settled agricultural

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ANNEX C

AGRICULTURE AND ANIMAL HUSBANDRY

I. Introduction

The main features of agriculture and animal husbandry in Iraq have already been set forth elsewhere and are only briefly recapitulated here.[1] Barley, wheat, rice, dates, other fruits and vegetables, and, more recently, cotton are the principal crops. Animal husbandry is of great importance but at present is really not integrated with agriculture. There is virtually no mixed farming. Crop and livestock yields are very low. Poor feeding is the principal cause of the low productivity of livestock. Low crop yields are attributable to poor drainage in the irrigation zone, to the failure to maintain soil fertility through the use of manure and fertilizer and the cultivation of soil-building crops, and to inadequate tools of production. Advances in agricultural techniques are seriously hampered by the poverty and ignorance of the fellahin who cultivate the soil and by the lack of interest displayed by most of the large landowners in improving agriculture. While there are extensive lands that can be put to the plow, particularly if more water is made available, a substantial portion of the land now in exploitation may be said to be overpopulated considering the present level of agricultural technique.

An increase in production is urgent. The standard of living which now prevails on the land is deplorably low. At the same time the population is increasing at a rate that can be expected to grow more rapid as public health improves. Output can be greatly increased both by extending the area under cultivation and by raising the productivity of land already being exploited. Primary emphasis has hitherto been placed on the first of these, and large new water storage and irrigation schemes are being planned.[2]

[1] See Annex A, *Basic Factors and Conditions.*
[2] See Annex B, *Flood Control, Irrigation and Drainage.*

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II. Diversification of Production

Fodder and Pasture

Existing crop rotation is far too limited and does not make effective use of the land. Wheat and barley are virtually the only winter crops. There are a considerable number of summer crops, but cotton and rice clearly predominate. Rice is really outside any crop rotation, since, for the most part, it is grown year after year on naturally inundated land. Fallow generally takes the place of good crop rotation. No doubt the large amount of water required for summer crops in relation to the available supply has hindered the introduction of new crops, but the water storage schemes that will be carried out over the next decade should bring a change in this respect. Moreover, economies in the use of water which may be effected may in the long run make more water available for summer cultivation.[3]

Basically the aim in the future must be to make fuller use of the land and the people who work it. The cultivator who grows wheat or barley in the winter does not have enough to occupy him except at sowing and harvest time and has still less to do in the summer. Conversely, the rice farmer has virtually nothing to do in the winter. On the average, cultivators keep little or no livestock outside of a draft animal or two and they grow no fodder and plant no pasture for their livestock. Hay-making is unknown. While in and around the towns grain, oil cake and cut legumes are used for feeding, in general the most important source of feed for sheep, goats, buffaloes and cattle alike are grain stubble and the uncultivated grasses and herbage. Thus the animals are left to forage for themselves. Under these conditions their food is adequate for only five to six months, barely sufficient for maintenance during three to four months and at starvation level for the remainder of the year.

Introduction of a mixed type of farming which will include leguminous fodder crops in the rotation with cash crops would mark a most important advance in Iraqi agriculture. Such crops will enrich the soil as well as provide feed for livestock. Better

[3] See Annex B, *Flood Control, Irrigation and Drainage*, pp. 208-09.

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241 231 feeding will make livestock far more productive and resistant to disease and produce better and stronger draft animals. By making the keeping and systematic feeding of livestock an integral part of settled agriculture, the people on the land will be assured fuller employment and higher incomes. Livestock should play a more prominent part in the farm economy for still another reason. The great bulk of the sheep and goats, which constitute over 80 percent of the livestock, are the property of nomads and semi-nomads. [221] Nomads from the northern and southern deserts regularly move into the riverine areas in search of summer pasture; and semi-nomadic shepherds move within the irrigated areas feeding their flocks on green barley, grain stubble and the grass and weeds of fallow land. Both are meeting with increased resistance from the settled farmers; and in any event the expansion of the area under irrigation will increasingly curtail the pasture available to the nomads. Thus the remaining nomadic tribes will need to be gradually settled, but they will adapt themselves readily to settled agriculture only if it will enable them also to maintain considerable livestock.

246 Among the forage crops berseem or Egyptian clover, a winter annual, is well-adapted to most of the irrigated area of Iraq and could be grown on a much larger scale. Sown in the grain stubble in late summer, it will provide a good pasture, soiling and hay crop. Alfalfa, a perennial, also makes a good forage crop capable of yielding 1.5 to 5 tons per donum for two to five years. However, in view of its deep roots, it cannot be recommended unless good cultivating equipment is available to kill it when necessary. For summer pasture, quick-growing crops such as millet or binder crops such as maize and sorghum should be grown. Summer legumes—cowpeas and mungo beans, and particularly the black mungo of India —can be recommended. The lack of water during the summer makes the problem of forage crops in the rain-fed zone more difficult. Large areas can, however, be planted to winter oats and vetch which, when cut, cured and cocked, will provide a good reserve feed.

248 The increased production of cotton which has taken place recently should be an excellent source of livestock feed once farmers learn to appreciate the value of oil cake feeding. For this

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IV. Improved Methods of Cultivation 241

Dry-farming Techniques

Following this discussion of specific crops, it will be appropriate to give some attention to the various improvements in cultivation which might raise the yields of agriculture in general. Many of these improvements will be of special benefit to wheat and barley which will continue to be the principal crops.

One important method of increasing the productivity of the land—namely drainage—has already been discussed elsewhere.[5] It is worth emphasizing again, however, that the excessive use of water which aggravates salting should be discouraged as far as possible. Farmers in both the irrigation and the rain-fed zone must be taught how to make the most of the available water. For this reason the methods of dry-land farming which have proven successful elsewhere could usefully be applied in Iraq. These stress the need to prepare a proper seedbed that will insure seedlings a good start, to plant when moisture conditions are right and to sow during overcast weather if possible. Second, they include a number of practices to reduce evaporation—furrow irrigation instead of flood irrigation whenever practicable; subsoiling to break the soil pan and permit better percolation of water to a greater depth; and mulching as soon as possible after irrigation. Finally, they seek to increase the water-holding capacity of the soil through the addition of organic manure in the form of green crops; by thorough cultivation to improve tilth and by less frequent irrigation, but with greater amounts of water.

Fallow Practices

The existing fallow practices could also be considerably improved. Fallow as practiced in Iraq does tend to restore soil fertility to some extent and lowers the water table in the irrigation zone, thereby reducing the danger of salinity. Improved crop rotation (including especially the cultivation of soil-building crops), the use of fertilizer, drainage and more economical use of water will all in the long run reduce the need to keep land fallow.

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[5] See Annex B, *Flood Control, Irrigation and Drainage*, pp. 203-06.

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For a considerable time to come, however, it will be an important factor in agriculture. Proper fallow will promote nitrification and store in the soil up to 30 percent of the precipitation during the fallow period. This is true, however, only where the fallow land is kept free of vegetation which depletes the soil moisture and uses up the accumulated plant food. In Iraq this is seldom done, either because fallow is used as pasture or because the available tools are not adapted to destroy the deep-rooted perennial weeds. The typical wooden "nail" plow, drawn by ill-fed and ill-kept animals, reduces the annual weeds but only encourages the more persistent, deeper-rooted species which subsequently offer stiff competition for crops following the fallow period.

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In the rain-fed zone considerable land is tilled where the rainfall is marginal. The yield on such land is usually very poor. During a 10-year period, for instance, there will generally be five fallow years, two crop failures, two fair crops and one good crop. Better results might on the average be obtained if grain were planted every year on rows two and a half to three feet apart. This would reduce the plant population per unit of area and permit intertillage to control weeds and conserve moisture. Tests of this sort might well be made.

Use of Fertilizers

Although soils are generally fertile and have sufficient potash, phosphorus and nitrogen for crop production under the existing fallow system, experiments have indicated that applications of nitrogen increase yields under certain conditions. This is true of vegetables, of green gram following wheat and barley in the rotation, of cotton following small grain, of dates and citrus fruits and of rice produced in areas where silt does not replenish the soil. On the other hand, in Iraq the application of fertilizer to wheat and barley in the fall has failed to increase yields materially, and its application to small grain frequently promotes excessive vegetative growth. Presumably this lack of response is due to the fact that grain is grown on fallow land which has had a chance to replenish its supply of nitrogen. It is possible, however, that even on such land nitrogen may be deficient in the spring, making a top dressing at that time beneficial. Experience elsewhere has demonstrated that proper crop rotation and use of fertilizers make

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possible more intensive utilization of the land. Experiments conducted over a long period in the United States have shown the reaction of wheat yields to fallow, fertilizer and crop rotation. The results indicate that yields respond most favorably to fertilizers used in combination with a crop rotation scheme.[6] There is great need to do more experimental work in Iraq in order to determine the optimum rates of fertilizer applications for various crops, the best time of application and the effect of green manure on production.

The high cost of fertilizers may have deterred their use. This handicap may be overcome if steps are taken to carry out the Mission's proposals to establish a large nitrogen plant at Kirkuk as well as a number of small bonemeal plants.

Tools and Draft Power

In discussing the need for weed control, reference has already been made to the lack of adequate equipment and good draft animals. In some parts of Iraq hand cultivation without the use of draft power may still be seen. In other parts, however, one can see the most modern tractors and combines at work in the fields.

Better tools and draft power will no doubt help to improve the productivity of the land both by destroying weeds and by better preparation of the soil. Similarly, better threshing equipment will raise the quality of the grain. This does not mean, however, that mechanization of agriculture will necessarily be the appropriate solution. Most farmers do not have sufficient land or money to warrant the purchase of a tractor or combine, and cooperative ownership will inevitably develop rather slowly. Moreover, under existing conditions the cost of amortization, operation and maintenance may be too high in relation to the cost of labor. Better plows drawn by sturdy animals may have largely the same effect as tractor-drawn plows in destroying weeds and improving prep-

[6] Yields under various conditions were as follows in terms of bushels per acre:

1. Continuous wheat, without fertilizer	12.33
2. Continuous wheat, with fertilizer	23.58
3. Wheat after one year of fallow	22.00
4. Wheat in a 4-year rotation, without fertilizer	24.00
5. Wheat in a 4-year rotation, with fertilizer	32.00

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241 aration of the soil. Similarly, small stationary threshers may offer a better alternative than large harvesting combines to the present methods of threshing by flaying and the tramping of animals. The government should pay at least as much attention to the task of getting simple, inexpensive tools into the hands of the cultivators as to the much more ambitious program of agricultural mechanization. [412] Good hand tools, for example, are almost nonexistent. Improvement in draft animals is also necessary. While the supply of draft animals cannot be increased rapidly, it is possible to get animals of greater strength and endurance by better feeding and selection.

In the longer run, however, there is no doubt that mechanization of agriculture will assume growing importance. Physically, the country with its flat broad plains is ideally suited to mechanization although the canals and ditches in the irrigation zone offer some impediments to the use of machinery. [464] Moreover, even now there are labor shortages at sowing and harvest times in some parts of the country, particularly in the North. In the future such shortages may become really acute as manpower is drawn from the land to take advantage of the new employment opportunities created by the over-all development program and as some of the fellahin working on land now under cultivation leave to settle new land. Under such circumstances mechanization may become the principal means of maintaining and expanding agricultural output. In its policy respecting mechanization the government will need to steer a careful course. On the one hand, it will want to keep some check on mechanization as long and wherever there is danger of displacing fellahin before alternative means of employment become available; on the other hand, it will find it desirable to accelerate mechanization whenever labor shortages become serious. Through its control over imports and credit, the government possesses effective methods of influencing the rate of mechanization.

241 407 427 The United States Lend-Lease Program gave mechanization its first impetus. At present there are probably about 170 combines and 550 tractors in operation in the country, with about half of the number concentrated in the provinces of Mosul and Baghdad. In addition, 75 combines and 81 tractors are owned and made

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available for rental by the Agricultural Machinery Administration, an autonomous agency within the Ministry of Economics.[7]

Further progress will be seriously impeded, however, unless means are found to prolong the life of machinery which is now less than half what it is in the United States. The shortage of spare parts and repair facilities has been very discouraging to machinery owners. The failure of private dealers to provide these largely inspired the government's original decision to establish the Agricultural Machinery Administration as a monopoly for the importation and distribution of agricultural machinery. In accordance with suggestions made by an earlier International Bank Mission, the government has tried to meet the problem by different measures, namely by licensing dealers only on condition they agree to set up repair facilities and maintain an adequate stock of spare parts. The enforcement of these requirements, however, will not provide a complete solution, even if it is supplemented by completion of the AMA program for setting up its own repair facilities at Baghdad, Kirkuk, Mosul, Diwaniya and Kut. The AMA and private dealers should also cooperate in conducting courses in operation and elementary maintenance of machines for drivers. Moreover, simple local facilities to carry out all but major repairs are needed. An adequate number of mechanics both for the central and local repair shops must be trained, and for this purpose foreign shop supervisors and instructors will be necessary. The Industrial Bank may have to cooperate by providing small loans for equipping local shops.

The AMA now performs a number of useful functions. It regulates imports and the distribution of spare parts and tests different types of machinery for their adaptability to conditions in Iraq. Most important, it maintains a pool of machinery for rental. In some respects its operations could undoubtedly be improved.

[7] An official estimate given to the Mission gives a total of 320 combines and 750 tractors. Customs statistics for the years 1945 to 1950 inclusive, however, show that only 632 tractors and 262 combines were imported. Part of these are already out of commission. An on-the-spot survey in each province by a member of the Mission indicated that only 170 combines and 549 tractors, exclusive of government-owned machines, were in operation. Of the combines, Mosul had 75; Baghdad, 75; seven provinces, one to five each; and five provinces, none. Of the tractors, Baghdad had 250; Mosul, 150; Kut, 40; Kirkuk, 23; Erbil, 15; six provinces, less than 10 each; and three provinces, none.

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VIII. Use of Incentives

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Through practical and realistic experimentation and demonstration much progress can undoubtedly be made in persuading farmers and livestock keepers of the value of more modern methods. Throughout the world, however, the farmer and shepherd tend to be conservative. Even though he sees other methods yield good results on experimental farms or even on his neighbor's land, he may still be reluctant to try them himself, particularly if it involves him in higher initial costs. The government cannot, after all, prescribe what he should do, except perhaps on land which it allots for settlement. If it cannot persuade him, the government may find it necessary to give him some financial incentive to induce him to experiment with new crops or fertilizer. Thus it might make seeds or stock of new and improved varieties available free of charge or at nominal prices or subsidize the cultivation of forage or soil-building crops or the use of fertilizer. The use of such incentives to bring about the adoption of new crops or better methods of cultivation has on occasion proved effective in other countries. Experience also indicates, however, that great care must be taken to prevent them from becoming permanent.

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The problem of incentives is particularly acute because the prevailing sharecropping system appears to offer a special obstacle to the introduction of forage and soil-building crops. Although the landlord can in theory direct his fellah to grow any crop, the fellah will in practice resist the cultivation of any crop which involves curtailing other crops he can consume himself or sell for cash. Generally able to eke out only a bare subsistence, the fellah is not likely to have any interest in growing fodder for which there is no cash market, especially when he has little or no livestock of his own. Similarly he is likely to oppose cultivation of a leguminous crop for green manure, especially since he himself may not get back the same parcel for farming the following year. He might ultimately be persuaded of the advantages of a given four-year crop rotation, but only if he were assured tenure of the same land over a sufficiently long period. The ways and means of overcoming these difficulties inherent in the existing tenancy system should be

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carefully studied by the government. In this study the possibility of offering financial incentives directly to the fellah and of making certain changes in the conditions of tenancy would need to be explored.

IX. Agricultural Credit

If farmers are to purchase fertilizer, more livestock and better draft animals, tools and machinery, they will need access to credit facilities. The Agricultural Bank with a nominal capital of ID 1,000,000 does not at present adequately serve their needs. First of all, its resources have been insufficient. As of March 31, 1950, the latest date for which a balance sheet was made available to the Mission, the capital actually paid in amounted to only ID 500,000. Its lending resources were supplemented to some extent by time deposits totalling ID 136,996. Total loans outstanding aggregated only ID 556,609. Since that date a further capital contribution of ID 50,000 has been made to the Bank, its time deposits have increased somewhat and a loan of ID 150,000, repayable in three annual installments, was obtained from the National Bank in April 1951. A shortage of liquid resources compelled the Bank virtually to suspend lending in November 1949. Not until a year later was it possible to resume credit operations and then only on a modest scale. The Bank has never been able to meet the demand for credit. Although authorized to lend up to ID 3,000 to any individual for a maximum term of 10 years, in practice it has limited the size of its loans to ID 1,000 and the duration to five years.

It would be desirable to increase the capital of the Bank substantially—to a total of perhaps ID 2,000,000. The Development Board would seem to be the logical and probably the only available source of funds for this purpose. The Bank would then be able to repay its debt to the National Bank and still extend its loan operations substantially. At the same time, however, there should be a careful review of the Bank's lending policies to make sure they are sound. In the past there has been a tendency for its loans to become frozen. In the fiscal year 1949-50, for example, only ID 108,333 of the total amount of ID 279,975 in loans falling due was actually received. Maturities were postponed on loans totalling

7: International Bank N. S-4 (1951) 1952 MH1 Iraq MH1

654 423 sive benefits, particularly in relationship to those who are not fortunate enough to be selected as beneficiaries. Moreover, the value of the benefits conferred may be all the more appreciated if some charge, which need not be burdensome, is made for them.

Fourthly, it may be desirable to reconsider the provision exempting the areas irrigated by high-lift pumps from distribution in accordance with the law. Apparently this provision was also dictated by the belief that the requisite pumping facilities would need to be provided by private investment and that such investment was unlikely to be forthcoming unless a comparatively large grant of land was made for development by high-lift pumping. In the future, however, public capital should be made available for the installation of such pumping facilities.

Finally, the safeguards against alienation of the land may need further strengthening. After the two consecutive periods of 10 years each, during which these safeguards would apply, it may still be desirable for the government to retain an option to purchase any of such land offered for sale. In this way it would be possible to prevent, if necessary, the gradual acquisition of excessively large landholdings in these newly developed areas.

A brief comment might be made regarding the settlement possibilities in the rain-fed zone. Much of the land available for such settlement may be submarginal from the standpoint of rainfall. Care must be taken, therefore, not to invest too much in the development of the lands the yield of which will be highly speculative. It is noted that the Department of Agriculture has drawn up an ambitious scheme involving the settlement of 1,000,000 donums and the establishment of 50 villages in northwestern Mosul near Balad Sinjar. There are indications, however, that the rainfall in this region may be insufficient to permit settlers to earn a good livelihood. If attempts are made to carry out this scheme, it is suggested that small-scale tests first be undertaken over a number of years.

654 423 241 166 The law for the development of *miri sirf* lands which has been discussed at length above is basically modelled on the 1945 act under which the Dujaila settlement was established in south-central Iraq near Kut. During the period 1946 to 1950, 1,058 farmers were settled in this area on 100 donum plots allotted from

7: International Bank N, S-4 (1951) 1952 MH1 Iraq MH1

state-owned agricultural land. The system of cultivation is prescribed. Thus 40 donums must be devoted to winter wheat and barley and five donums to summer crops. In addition five donums are to be planted with fruit, although evidently only 350 of the older settlers have such gardens in which grapes, greengage, apricots and date palms have been planted.

On the whole, the Dujaila scheme has been conspicuously successful. There is no doubt that the settlers who formerly were poor sharecroppers are now far more prosperous and contented. Most of them are obviously proud of their accomplishments. Their mud houses, although not built according to standard specifications as originally planned, are larger and more substantial than those of other fellahin. As already indicated, interesting experiments with cooperative organization have been carried out. In addition a useful start has been made with the planting of trees along roads and boundary lines.

The Dujaila venture has not, however, been an unqualified success. The failure to install drainage facilities has led to progressive salination and already some of the land has been abandoned. The administrative staff on the spot totals 75 people. Even after allowing for the fact that the staff also controls the distribution of water within the scheme and the operation of two nurseries, this number seems excessive. Aside from insisting that five donums be planted to fruit trees, nothing has been done to improve agricultural and livestock practices. Thus the increased prosperity of the farmers is solely due to the fact that they have more land to till and do not have to surrender a share of their crops to a landlord. There is no agricultural extension service on the spot capable of working with the farmers. In fact, the Department of Agriculture is not even represented on the committee which directs the scheme. Two nurseries are located in the scheme, but they serve simply to supply fruit trees for garden plots and other trees and cannot in any sense be considered demonstration units. It is generally agreed also that the scattered mode of settling the people was ill-advised, since it ignored the need for a community life and made it difficult to provide such community facilities as safe water, schools and health centers.

8:Campbell T-5 (no date) 1949 MH1 Iraq MH1

would know the difference.' They went on to point out large numbers of sheep dotted around the horizon and they explained that had there been a large number of camels with a few sheep, then bedouin would have been indicated. Instead there was a large number of sheep with a few camels, indicating Arabs. They had to go on to explain that by Arabs they meant the great landowning Shia tribes, who are in the main cultivators of rice, dates, barley and a variety of other crops, but they send out their sheep on long treks through the desert in charge of some of their families in search of grass.

Most of the Arab tribes are dwellers in houses or clean, cool huts made of reed matting, which allows for a constant current of air through the hut, and prevents the temperature from rising to that of an oven in the hot sun, like a house. Many of these stories were told in a large guest house or tent pitched amongst the houses, with a background of sound varying from that of the cooking of a meal of several roast sheep to the powerful thump, thump, thump, of the great pumps. These pumps deserve mention, since they are often a tribe's principal pride and source of wealth. At one place I was surprised to hear that a boy's name was Rustam, since this name is more common amongst Persians and Kurds than amongst Arabs, but it was explained to me that he was named after the pump, and I understood when I saw the name Rustom stamped on an iron plate on the great cylinder.

The Arab tribes have a great military history of which they are justly proud. It is long and somewhat complicated, and to give in full the history of a single tribe as told by the sheikhs would fill a book greater in size than this. I will, however, give a précis of the history of that great group of tribes which were known as the Muntafiq.

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[For information on the following cultigens, see MA1 Iran, 35: Hooper and Field, category 116, pp. 80-188; sweet flag root (Alcorus calamus) onion (Allium cepa), garlic (Allium sativum), celery (Apium graveolens), beet (Beta vulgaris), rape (Brassica campestris), chili pepper (Capsicum frutescens), safflower (Carathmus tinctorius), bishop's weed (Carum copticum), parsley (Carum petroselinum), watermelon (Citrullus vulgaris), jute (Corchorus olitorius), coriander (Coriandrum sativum), cucumber (Cucumis sativus), pumpkin (Cucurbita pepo), cumin (Cuminum cyminum), artichoke (Cynara scolymus), carrot (Daucus carota), kidney bean (Dolichos lablab), Malabar cardamom (Elettaria cardamomum), fennel (Foeniculum vulgare), lettuce (Latuca sativa), bottle gourd (Lagenaria vulgaris), chickling vetch (Lathyrus sativus), henna (Lawsonia alba), lentil (Lens esculenta), hoary cress (Lepidium draba), garden cress (Lepidium sativum), flax (Linum usitatissimum), mint (Mentha sylvestris), four-o'-clock (Mirabilis jalapa), black cumin (Nigella sativa), sweet basil (Ocimum basilicum), white basil (Ocimum canum), mountain rue (Peganum harmola), dill (Peucedanum graveolens), mash (Phaseolus radiatus), aniseed (Pimpinella anisum), French bean (Phaseolus vulgaris), radish (Raphanus sativus), madder (Rubia cordifolia), garden rue (Ruta graveolens), spinach (Spinacia oleracea), Merian golè (Salvia officinalis), fenugreek (Trigonella foenum-graecum),

horse bean (Vicia faba), cow pea (Vigna catjang), and jujube (Zizyphus vulgaris.)]

[The information on the cereal crops--barley (Hordeum vulgare), rice (Oryza sativa), common millet (Panicum miliaceum), sesame (Sesamum indicum), giant millet (Sorghum vulgare), and wheat (Triticum vulgare)-- has been filed under category 243, pp. 126-127, 147, 170-171 and 173. That on the forage crops--mash (Phaseolus radiatus), horse bean (Vicia faba), sesame (Sesamum indicum), common millet (Panicum miliaceum), alfalfa (Medicago sativa), giant millet (Sorghum vulgare), Egyptian clover (Trifolium alexandrinum), the sunflower (Helianthus anuus), and chickling vetch (Lathyrus sativus)--has been filed under category 246. That on cotton (Gossypium sp.) has been filed under category 248, and the information on tobacco and poppies will be found under category 249. Data on ornamental plants-- khatmi (Althaea lavateraefolia), the pot marigold (Calendula officinalis), the nettle tree (Celtis australis), the castor oil plant (Ricinus communis), various roses, and the African marigold (Tagetes erecta)-- have been filed under category 247, pp. 83, 93, 97, 162 - 165, 175 and 178. Information on tea

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(Thea sinensis), the date palm (Phoenix dactylifera), the fig (Ficus carica), the grape (Vitis vinifera), and the castor oil plant (Ricinus communis), the quince (Pyrus cydonia), sumac (Rhus coriaria), mulberry (Morus nigra), sesbania (Sesbania aculeata), the sebestan plum (Cordia myxa), Persian lilac (Melia azedarach), the walnut (Juglans regia), the bitter almond (Prunus amygdalus), the apricot (Prunus armenaica), the sour cherry (Prunus cerasus), the common plum (Prunnus domestica), and the Bokhara plum (Prunus institia), all of which are trees or shrubs of some economic importance, has been filed under category 245.]

2: United Nations U-4 (no date) 1950 M1 Middle East
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riya), and Sulaimaniya. The capital of Iraq is Baghdad, with a population of 552,047 inhabitants, according to the census of 19 November 1947. Baghdad, which is situated on the Tigris and is the terminus and junction of all the Iraqi railways, is an active centre of trade and traffic. Other large towns are Mosul (340,541 inhabitants), Basra (206,302), Amara (183,870), Karbala (149,710), Kirkuk (148,349), Nasiriya (110,934), Ramadi (110,684), and Baquba (94,482).

B. *General features of the economy*

Agriculture

Agriculture is the main resource of Iraq's economy. According to estimates, approximately 80 per cent of the population are engaged in it. The fertile land of Iraq, which was regarded as one of the granaries of the world in the time of Herodotus and which was carefully watered by a well-planned system of irrigation until the thirteenth century of our era, has since then fallen into a state of neglect. Agriculture began to receive attention again in 1921. As droughts, dust storms and plagues of insects (especially in the Mosul region) cause serious depredations, the government supervises the condition of the country's agriculture and stock-raising and takes the necessary measures for their rational development: it has set up experimental farms, which also produce good quality seeds for the use of farmers, and is encouraging the mechanizatio of agriculture.

3/2 The area of arable land is now estimated at one-fifth of the total area. A new system of irrigation has been put into operation: many canals have been dug; dams have been built, the largest of which are the Kut dam, which is 500 metres long and irrigates 2,225 square kilometres, and the Diyala dam, which irrigates the whole province of the same name; reservoirs and pumps have been installed: in 1946-47, 3,168 pumps, with a total capacity of 111,687 h.p., were in operation in the Tigris basin, 973 in the basin of the Euphrates, and eighty-seven in the basin of the Shatt al-Arab and in the creek of Basra.

● 241 The main crops are as follows:

1. Cereals: barley, especially north-east of Kirkuk and in the regions of Kut and Muntafiq, south-east of Baghdad, in the irrigated area; wheat, north of Kirkuk (where the best quality is grown), in the regions of Baghdad, Kut and Diwaniya, and also east of Ramadi; rice, in the regions of the lower Euphrates, near Suq ash Shuyukh and east of Nasiriya and the Tigris, south of Amara, and in the districts of Diwaniya and Hilla. In the southern part of the country, maize and millet are also cultivated.

2: United Nations U-4 (no date) 1950 M1 Middle East
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241 2. Fruit, especially dates: it is estimated that Iraq's date crop accounted for 80 per cent of world production in some years; the largest harvests came from the regions south of Baghdad, including the Euphrates Valley (between the northern district of Hilla and Nasiriya), south-east of Ana, and especially in the valley of the Shatt al-Arab, notably in the Basra region; large quantities are exported. Other crops are oranges in the Mosul region and north of Baghdad (Baquba and Mandali), grapes (north of Mosul), cotton in the Baghdad region, cane from Hilla and Diyala; tobacco is also grown, especially between Baquba and Mandali.

Stock-raising

239 Stock-raising represents an important factor of Iraqi economy. The principal areas are as follows: for sheep, the region of the upper Diyala (a tributary of the Tigris), and the southern part of Sulaimaniya (wool is exported for carpet manufacture); for goats, the Tigris Valley, especially the right bank, near Samarra; camels are raised mainly in the south-west of the country, south of Rutba; horses, mules and asses are reared more or less everywhere.

3sRoyal Institute of International Affairs U-4 (no date)1954 M1 Middle East
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Chapter Five

IRAQ

The Land

131 The area of Iraq within its present frontiers is approximately 175,000 square miles. It is most conveniently divided into three distinct geographical sections: the Mesopotamian plain, the Uplands, and the Folded Mountain Belt. The first of these is historically the most important for it was the plain which nursed the great civilizations of the past, and its two great rivers which nourished them.

133 *The Plain.* To the north-east the southern alluvial plain follows the foothills of the Persian mountains up from the sea, turns south-east across the old river estuaries at Samarra and Hit, and returns parallel to and west of the Euphrates. Within these limits the soil is stoneless alluvium. The two rivers flow in channels somewhat above the rest of the plain, which is consequently liable to be flooded during the high-water period in the spring when the snows melt in Kurdistan; local rain has comparatively little effect on the rivers. The Tigris rises in late March or early April, the rise at Baghdad being sometimes as much as 23 feet; the Euphrates rises two or three weeks later than the Tigris, a maximum of about 14 feet (at Faluja); both rivers are at their lowest in September–October. At no point is the plain higher than 150 feet above sea-level.

132 The annual rainfall in the plain averages about 6 inches only; this rain occurs usually between mid-November and mid-March, the wettest month being February; but it is impossible to generalize, as a complete season's rainfall may occur in a space of three weeks, the remainder of the winter being dry. [241] Cultivation in the plain depends almost entirely on irrigation, the rainfall often being insufficient to mature a winter crop.

133 The rivers, which have frequently changed their courses throughout history, unite about sixty miles above the city of Basra in a single great channel, the Shatt al-Arab. Also above Basra is the marshland of the Muntafiq and Amara *liwas*, where a distinctive group of Arabs—the 'marsh Arabs'—live on fish and the produce of their mud-banks and swampy islands, or tend their buffaloes from shallow-draft canoes.

3:Royal Institute of International Affairs U-4 (no date)1964 M1 Middle East
Iraq MH1

cent of Iraq's oil revenues. The cost of the initial programme of the Board, as approved by Parliament, covers the years 1951–6 and is estimated at ID155,374,000. It provides for studies and research and training of Iraqi engineers and technicians; an ambitious plan for irrigation and drainage, including a number of major projects; the construction of roads, bridges, hospitals and health institutes, schools, housing for labourers and officials and public buildings; land reclamation, afforestation, agricultural research, animal husbandry; development of water-supplies, health resorts, aerodromes; industrial and mining projects. The programme of the Development Board has taken account of the report[1] of the mission of the International Bank for Reconstruction and Development, which, at the request of the Government of Iraq, visited Iraq in 1951 to review the country's economic potentialities and assist the Government to formulate a long-term programme for the further development of productive resources.

By the end of 1953 measures had been taken towards the implementation of practically every item of this programme. Of the major projects, work on the Tharthar scheme for Tigris flood control was well in hand and its completion scheduled for March 1956. The Habbaniya scheme was sufficiently advanced to permit flood control of the Euphrates; work had already begun on the barrage, which would be completed at the end of 1955. Preliminary work was in progress for the construction of dams on the rivers Diala, Lesser Zab, and Greater Zab, and schemes were under investigation for drainage and water utilization in the south and the generation of hydro-electric power. The construction of a bitumen refinery at Qaiyara, south of Mosul, was imminent and designs were complete for cement plants at Mosul and Kirkuk and a cotton textile factory of an annual capacity of 25 million square yards in Mosul.

Agriculture

Iraq is predominantly an agricultural country. It is estimated that about 80 per cent of the population derives its living directly or indirectly from the soil and, apart from oil, exported products are almost entirely agricultural. Nevertheless only some 20 per cent of the total area of the country is cultivable, and only some 36 per cent of this is actually under cultivation. The cultivable area has two main divisions: first the region to the north and east of a line running south of Mosul and Kirkuk to Khanaqin, where the rainfall is sufficient to permit the cultivation of winter crops without irrigation; and second, the

[1] IBRD, *The Economic Development of Iraq* (Baltimore, John Hopkins Press, 1952).

3:Royal Institute of International Affairs U-4 (no date)1954 M1 Middle East
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alluvial plain of the centre and south, where agriculture depends on the water of the Tigris and Euphrates for irrigation by pump, flow, or natural inundation. In the first region rainfed winter cereals predominate, with millet, maize, sesame and other summer crops grown as subsidiaries where irrigation is possible. Kurdish mountain crops include tobacco and grapes. In the central canal zone (Faluja–Baghdad–Diala) wheat and barley are the principal winter crops; summer crops include millet, maize, sesame, and the produce of market gardens near Baghdad. From here southward barley and rice predominate, with a great concentration of palm groves in all the riverain land, especially around Basra on the Shatt al-Arab. The deserts of west Iraq afford extensive grazing after the winter rains.

Cultivation is based traditionally on the following system. In the south, either half the land is left fallow and half tilled each year, or half is sown with a summer crop, half with a winter. In the north the land may be continuously cropped for two or three years, and then left fallow for the same period. The use of artificial fertilizers is practically unknown, but the land is sometimes manured by allowing shepherd tribes to pasture their flocks on fallow ground.

Although the vast majority of agricultural implements employed are still traditional and primitive, modern machinery is being imported steadily. A high target has been set, especially since the war, and Government service stations have been established. In 1950 imports were as follows: tractors 166, ploughs 146, cultivators 26, combines 98, threshers 1, grain drills 21, disc harrows 14. Oil pumps for irrigation are even more in demand than tractors; in 1949–50 there were 3,600 in use, with an average horse-power of 36.

The agricultural development of the country is organized by the Ministry of Agriculture, which contains departments for plant breeding and protection, horticulture, forestry, agricultural machinery, animal husbandry and veterinary services.

Crops

The principal crops, with their production in 1950 in thousands of metric tons, are *Winter*: barley, 851; wheat, 520; lentils, 6; vetch, 3·5; linseed, 0·2; *Summer*: rice, 242; cotton, 25; sesame, 10; maize, 21; millet 19; green gram, 12; tobacco, 3 (purchased by Government Tobacco Monopoly); dates, 250.[1] Of the two most important crops, barley and dates, the former is grown mainly in the northern plains and the *liwas* of Kut, Muntafiq, Hilla, and Diwaniya in the irrigated zone. With a

[1] ibid. p. 146.

3:Royal Institute of International Affairs U-4 (no date)1954 M1 Middle East
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Tigris, completed in 1939; both of these control the flow of water and serve extensive irrigation schemes. In 1952 8 million acres of land were under irrigation—five times the area in 1918; in 1949–50 3,600 pumps were in use as against 143 in 1921. Two more major projects are in process of execution: the first on the Euphrates, for which the Habbaniya Flood Relief and Storage Scheme has just been completed, and a barrage across the river at Ramadi is awaiting construction; the second for the Tigris, whose waters will be drawn off into the Wadi Tharthar as a means of flood prevention. Cultivation will be increased by dams at Darband-i-Khan, Bakhma on the Diala, Dukhan on the Lesser Zab, and possibly at Bakhma on the Greater Zab, the first also serving for flood control. Schemes of lesser construction and extension are also being planned and executed for southern Iraq. In all, the Development Board has allocated nearly 53½ million dinars for projects of irrigation and flood control during the years 1951–6, of which 4 million dinars are devoted to drainage.

Land Tenure and Conditions of Cultivation

The system of land tenure and the conditions of cultivation are responsible for a further major problem in Iraqi agriculture. There is very little peasant proprietorship. Much of the land is held on various terms by Arab tribal shaikhs and Kurdish aghas (barons) or by wealthy townsmen, who divide their land in small plots among sharecroppers, to cultivate under the supervision of their agents for a return which may be as little as 30 per cent of the yield. Of the area covered by cadastral survey, 67 per cent is held in holdings of over 1,000 dunams and 24 per cent in holdings of over 10,000 dunams. Agriculture remains, on the whole, primitive and wasteful in tools and technique because of the lack of interest, on the part of the landowners, in organization and development and because of the ignorance, poverty, and lack of security or incentive—since the landlord secures the advantages of all improvements—of the cultivators. This backwardness is illustrated by the generally low yields. The disadvantages of feudal and absentee land ownership have been perpetuated by the land settlement of the last fifteen years, which, by tending to confirm the existing procedure, has made reform more difficult of fulfilment. The establishment of large farms worked directly by their owners with modern machinery is usually prevented by the almost total absence of a class of farm labourer working for cash wages. The expansion of the cultivated area, particularly in south Iraq, is hampered by the sparseness of population. Labour is specially scarce at harvest

20: Hourani S-5 (1945) 1947 M1 Middle East
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development of an Iraqi nationalism, regarding all Iraqis without distinction as equal citizens of the State. 641 563

These two tendencies are not necessarily opposed to one another except in their extreme forms. A Pan-Arab would generally concede the value of local feeling provided it is kept in its proper place; an Iraqi nationalist would not oppose Iraq's membership of the Arab League. They differ not in essence so much as in emphasis. This difference, however, is important; and it is clear that the future of the minorities will be greatly affected by which of them prevails. If the exclusive Iraqi nationalism prevails, the way will be open for all minorities to become full citizens, although this will not save them from the necessity of at least some degree of assimilation. If Pan-Arab sentiment prevails, then a serious Kurdish problem may arise; and a Christian problem as well if Pan-Arabism is not dissociated from Islamic feeling. 668

The Kurds: Description

The Kurds form a compact community with a local majority in the north and north-east of Iraq. Most of them are concentrated in the liwas of Mosul, Irbil, Kirkuk, Sulaimania and Diala. The regions which they inhabit are largely mountainous, and a great proportion of them are nomadic or semi-nomadic pastoral tribesmen, pasturing sheep, goats and other animals, moving up the mountains in the summer and down again in the cool weather. Others of them, however, are farmers in the plains and valleys, who cultivate wheat, fruit, rice and tobacco; not all the farmers however are wholly settled, some of them being semi-sedentary. 563 221 [241]

Most of the Kurds are Sunni Moslems, although a minority belong to extreme Shi'i sects. Again, most of them preserve their Kurdish language and customs, although in certain districts they are bi-lingual and a few tribes are in process of being Arabized. Their language is not unified so much as a group of dialects, some of which differ partly from one another. Similarly, they themselves do not form a single community but a group of tribes. Among the wholly settled Kurds the tribal organization is becoming weaker, but in the mountains it is still very strong, and in general it is true to say that tribal loyalty is stronger than any other. The tribesmen, like most mountain peoples, are restless under civil government and positive law. They willingly 563 619 178

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Chapter VII

IRAQ

LAND AND POPULATION

THE peculiar feature of agriculture in Iraq is that in the greater part of the country extensive farming is practised on irrigated land. Elsewhere in the Middle East irrigation is always accompanied by a great intensification of production, but in Iraq extensive and shifting cultivation is practised even on irrigated land, and both land and water are wasted.

The productive area of the country falls into two halves—the rainfall zone in the north, and the irrigation zone of the south, on the alluvial plain between the two rivers.

In the irrigation zone, there is no controlled system of irrigation, as in Egypt. Each river has a modern barrage, the Tigris at Kut, and the Euphrates at Hindiya, but both are situated low down towards the delta, and command a comparatively small area of cultivation. Apart from the areas served by the barrages, the main system of irrigation is by flow, that is, by basin irrigation.

There are two flood periods, December to March, due to winter rains, and March till May, when the snow melts in the higher reaches of the rivers, and there are therefore two crop seasons. The danger of flood is always present, because the level of the rivers in many parts is a few feet higher than the level of the plain. Some progress has been made in recent years in flood control, as for instance the Habbaniya escape, but there is great need for a reservoir in one of the upper tributaries of the Tigris to prevent flooding in the spring and to release extra water in the dry season.

In recent years there has been a rapid extension of cultivation as population has increased. In 1918, the total cropped area in the irrigation zone was only 936,500 acres, and in 1943 it had increased to 4,241,718 acres.

The classification of land in Iraq presents difficulties, because not all the cultivable area is cultivated and not all the cultivated area is cropped.

The main divisions in 1943 were as follows:

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sections or clans, under the direction of the sirkal, the head of the clan, who organized the members of the tribe on a share-cropping basis, the peasants generally taking a half, two-fifths, or a third of the produce.

But even on these individual holdings communal ownership is manifested in several ways: for instance by the fact that sub-tribal chiefs can be shifted from their holdings by the tribal chiefs; by the right of pre-emption and veto exercised by the tribe over transfer of land from one member to another, and especially to outsiders; the fact that women are excluded from inheriting land; the moral duty of employing members of the tribe in preference to outsiders; and in certain parts of the country, reallotment of the land on the *mushaa* system.[1]

The method of farming necessitates the existence of some measure of communal cultivation and ownership. Cultivation by irrigation involves many duties which cannot be performed by one household—the clearance of canals, the building of dams across channels, and the strengthening of the river banks; all these functions require tribal organization. Hence the head of the clan, the sirkal, was originally a manager on behalf of the tribe; he employed the peasants and divided the land among them into plots to support them until the harvest, appointed the dates of sowing, harvesting, and threshing, and organized irrigation and canal clearance.

Thus, although the tribe exercises a right of occupancy over the tribal *dirah* and can prove occupation of the whole area, it cannot be proved in the same sense that the peasant has a certain plot of his own occupied for a number of years. Within the tribal *dirah*, the area cultivated by each group shifts as canals silt up and the land is impoverished by salt, and so the area cultivated by each peasant shifts also. The peasants themselves are largely mobile, both within the tribal *dirah* and outside it; cultivation is rather half-hearted and grazing remains an alternative occupation.

It must be remembered that the tribal system, when it prevailed generally, had no legal basis, and no protection from the State; the tribe was, in fact, in itself a unit of political organization, and itself performed the State's functions. Within the

[1] From an unpublished report by Dr Salih Haider, on 'The Problem of the Land in Iraq' (1944).

25: Warriner S-5 (no date) 1948 MI Middle East
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over larger areas, much as the pump owners are doing on the Lower Tigris.

But in the north-eastern rain-fed zone, Kirkuk, Erbil, and Sulaimaniya, the position of the cultivator is better. There is a settled system of cultivation and a large part of the land is held by small proprietors. In the plain lands of Kirkuk and Erbil as much as 75 per cent of the land is held by small cultivators with holdings up to 200 dunums. Here the method of cultivation is much the same as in Syria, a *daim* (i.e. dry) crop being taken every two years.

Here too the legal position is different. In this part of the country, the provisions of the Ottoman Land Code remained in force, and most of the land was registered in Turkish times. Frequently the *agha* (or *mukhtar*), who was originally the patriarchal head of the village with the duty of maintaining order, has used his position to acquire land, and registered the land of the village under his own name. This has happened particularly often in the Kurd villages, where in spite of the Land Code's explicit prohibition of granting an entire village in the name of one person, the Turkish authorities, for the sake of peace, registered whole groups of villages in the names of the notables of Mosul, Erbil, Kirkuk, and Sulaimaniya.

But even though the landlords have obtained title to land, the share paid to them is much less than in the south, and amounts to only 10–20 per cent of the product.

Thus the problem of reforming tenure is here much less acute. As in Syria, peasant indebtedness is the major problem, but in the course of the recent war the high prices of grain have enabled the majority of the peasants to wipe off the burden of debt.

In the high mountain regions, however, particularly in the Zibar district, there is acute agricultural distress; a series of bad harvests due to plant disease, insect pests, and insecurity, has caused the agricultural economy to go steeply downhill in the past few years.

Settlement of Title. During the nineteenth century, the Ottoman Government attempted to settle title to land under the Land Code, as it did in the rest of the Turkish Empire. The Code was extended to Iraq under Midhat Pasha with the object of registering occupiers of land and thereby granting them

25: Warriner S-5 (no date) 1948 MI Middle East
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landowners, and the occupying peasants, which has from time to time led to outbreaks of violence.

In the Amara liwa for instance the sheikh has fairly complete power over his tribal sirkals and fellaheen. 'He switches his secondary lessees around at the yearly leasing time, throwing out any one he disapproves of, allotting the portions of land either by a form of auction or by direct agreement. The power of the sheikhs varies with the prosperity of the estates. The poor estates in the liwa, for instance, the Beni Lam estates, are short of labour and the sheikh is glad to get any comer on almost any terms. In such estates, the pump-owning secondary lessees (or sirkals) become the real masters of the land they cultivate, and the sheikh becomes a rent receiver. Other poorer estates in this district are becoming the property of the big rice merchants of the towns.'[1]

A report from the Muntafiq liwa describes similar conditions. The land is being ruined by bad farming, because year after year the same land is sown with a winter corn crop, and gets no rest either through fallow or through a rotation of crops. The government regulation that land must remain fallow in alternate years is disregarded. 'Perhaps the greatest racket in this area is the undue amount of the crop taken by pump owners,' says the report. This is due to the lack of any credit system: much forward selling of the crops takes place as soon as the green appears, at ruinous prices to the cultivator, sometimes in return for a loan amounting to about a quarter of the current grain price.[2]

In the densely settled regions of the south, such as Muntafiq, the position of the cultivator is particularly bad. He usually receives only a 30 to 50 per cent share of the produce. A typical apportionment of the crop is:

Government	10 per cent
Principal tenant (sheikh)	7½
Sirkal	2½
Landowner (either the sheikh or a notable)	40
Fellah	40
TOTAL	100[3]

[1] ibid.

[2] From an unpublished report prepared for M.E.S.C. on 'Land tenure in Muntafiq Liwa', 1944.

[3] A. Bonné, 'Conditions and Problems in the Agriculture of Iraq', *Bulletin of Agricultural Economics and Sociology* (International Institute of Agriculture, Rome), February 1934, p. 59–E.

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Iraq MHI

COTTON IN IRAQ

Import duties on textiles are relatively modest—from 11 to 20 per cent ad valorem. However, at the insistence of the mills the government has completely embargoed importation of yarns up to count 40s and closely controls foreign exchange for imports of cloth.

Table 31

IRAQ: Textile Products Available for Home Use 1938, 1948, 1949, 1950, and 1951

Year and Item	Consumption	Net Imports: Yarn	Net Imports: Cloth	Available for Home Use	Population	Per Capita Availability
	1,000 Metric Tons				Millions	Pounds
1938						
Cotton		.4	6.0	6.4	4.0	3.7
Wool	3.0	.1	2.2	5.3	4.0	2.9
Rayon		.1	2.2	2.3	4.0	1.3
Total	3.0	.5	10.4	14.2	4.0	7.9
1948						
Cotton	.7	.5	7.5	8.7	4.9	4.0
Wool	5.0		.6	5.6	4.9	2.6
Rayon		.1	.2	.3	4.9	.1
Total	5.7	.6	8.3	14.6	4.9	6.7
1949						
Cotton	1.1	.1	6.9	8.1	5.0	3.5
Wool	5.0		.5	5.5	5.0	2.6
Rayon		.1	.6	.7	5.0	.3
Total	6.1	.2	8.0	14.3	5.0	6.4
1950						
Cotton	1.1		8.0	9.1	5.1	4.0
Wool	5.0		.5	5.5	5.1	2.6
Rayon		.2	.6	.8	5.1	.4
Total	6.1	.2	9.1	15.4	5.1	7.0
1951*						
Cotton	1.4		6.1	7.5	5.2	3.2

* Estimated from trade sources.

SOURCE: Food and Agriculture Organization of the United Nations.

AGRICULTURE

From the statistics it would appear that agricultural production has been going down in relation to the population and that considerable pressure is developing on the land. The Food and Agriculture Organization's reports, which are based on the official figures for the country, show reduced acreage, sharply declining yields, and lower consumption of food in the postwar compared with the prewar period. But the United States Agricultural Attache, who has lived in this general area for many years and is intimately familiar with agriculture, expresses the same skepticism about the Iraqi figures as he does about agricultural statistics in the other Middle East countries. It is his view, and that of a number of other local agricultural leaders, that these figures simply are not correct and that both the output and consumption have been maintained fairly well.

Iraq is normally self-sufficient in food. Occasionally, in years of poor crops small quantities of cereals are imported, but the country usually has a

29:Dunn S-4 (1952)1952 MI Middle East
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241 substantial surplus of barley for export. Sugar and tea are about the only agricultural commodities always imported.[39]

PRODUCTION

Agriculture in Iraq is devoted largely to the cultivation of winter crops. Because of the lack of rain in the south, summer crops can be grown only under irrigation. In the rain-fed zone of the north, summer crops can be grown on a moderate scale. In the irrigated zone of central and southern Iraq the limited water supply restricts the area devoted to summer crops to only about one-quarter of that grown to winter crops.

Barley and wheat are the only significant winter crops, while rice and, more recently, cotton are the principal summer crops. The area sown to sesame, corn, millet, and grain sorghum is comparatively insignificant. Tobacco assumes some importance in the mountainous areas of the north. Fruit and vegetables are quite important. Iraq is the world's principal producer and exporter of dates. Excellent citrus fruit is grown, particularly in the Diyala Valley in east central Iraq for domestic consumption, and other fruits and nuts are cultivated, mainly in the north.

233 Livestock raising is an adjunct to agriculture rather than an integral part of it. Sheep and goats predominate because they thrive despite poor grazing and feeding. Sheep and goats as well as camels are kept primarily by pastoral nomads.

YIELDS

241 Crop yields are generally low for a number of reasons. The water supply is frequently inadequate. Agricultural methods have on the whole remained unchanged for centuries. Little or no animal manure or fertilizer is applied to the soil, animal dung being used largely for fuel. Crop rotation is wholly inadequate and makes little or no provision for soil building crops. Salinity, attributed to poor drainage, has materially lowered the productivity of land in the irrigated zone. Owing to insufficient and poor draft animals and lack of proper equipment, the soil is often poorly prepared and weeds detract from yields. Up to half of the winter crop area is left in fallow as the means of restoring fertility, but since the land is generally allowed to grow up in weeds to afford grazing for animals, the efficacy of the fallow system is limited.

LAND TENURE

423 427 Ownership of cultivated lands is largely in the hands of sheiks and urban proprietors who entrust the actual cultivation in small parcels to sharecroppers. These sharecroppers have neither the equipment nor the knowledge to increase production and for the most part eke out a bare existence. The land assigned to the *Fellah*, or peasant, often changes from year to year so that the cultivator has virtually no incentive to improve it.

About 67 per cent of the privately-owned land is said to be in units exceeding 618 acres.

Most of the landowners are said to show little interest in improving agriculture. In the irrigated zone the *Fellah* generally gets only half of the crop, even though the state provides the irrigation works. His share is even smaller when the land is irrigated by privately-owned pumps or when the landlords supply seed, draft animals, or machinery.

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39 "Iraq," *International Reference Service*, March, 1950.

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COTTON IN IRAQ

The problems of land tenure are generally cited as being a restriction to agricultural development. One United Nations' study states the absence of settlement title is undoubtedly a major obstacle to expansion of cultivation of dry land and intensification of agriculture in irrigated or irrigable zones.[40] The same report also points out that the lack of adequate legislation on water rights is another serious defect.[41]

RESETTLEMENT

Sizable areas are being settled by the state under the provisions of a law passed in 1951 which distributes about 67 acres per family to landless people, agricultural school graduates, former civil service employees, pensioners, and the unemployed. The farming program on these projects is supervised rigorously. On the 75,000-acre Dujaila Project on the Tigris River the prescribed planting program is as follows: 20 per cent in wheat, 15 per cent in barley, 5 per cent in fruit, 4 per cent in cotton and flax, 3 per cent in sesame, and 3 per cent in vegetables. Another 5 per cent will be devoted to housing, and the remaining 45 per cent must lie in fallow because of a water shortage.[42]

The Mission report criticized these land settlement schemes on several bases. The land is given to the farmers, the title being transferred after 10 years of successful operation. The Mission believes the land should be sold. The Mission also criticizes the allocation of land to people who have had no farming experience and who have not necessarily shown themselves to be suited by temperament for farming, and it expresses doubt that the program actually has improved the land or the farmer. The economic report stated: "The improved economic position of the cultivators in the new Dujaila scheme is almost wholly due to the fact that the farmer there has a larger plot of land and does not need to surrender a share of his output to his landlord."[43]

There are half a dozen other projects, involving 250,000 acres, in various stages of promotion which the Point Four Mission is being urged to assist in planning and supervising.

IRRIGATION

At present irrigation water is provided by the Kut and Hilla Barrages on the upper Tigris River, several smaller ones on the lower reaches, and the Hindiya Barrage on the Euphrates River. The water is carried by pumps and canals. About 2 million acres are irrigated by pumps and another 4 to 5 million acres by gravity flow.

Estimates indicated cultivatable land can be expanded almost three times if water is available. Yet, under current conditions, the supply of water does not permit even the effective irrigation of the area already in use. Projects for the storage of excess water which pours down the Tigris and Euphrates Rivers during the spring flood season are clearly essential. The government already has initiated work on the Habbaniya Lake storage system for the Euphrates River and has let the contract for the first stage of the Wadi Tharthar flood control project on the Tigris River. The Development Board is undertaking also construction of three dams on the upper tributaries of the

40 *Land Reform*, United Nations, 1951, p. 27.

41 *Ibid.*, p. 27.

42 *Final Report of the United Nations Economic Survey Mission for the Middle East*, United Nations, December, 1949, p. 31.

43 Boardman, Frances, "Iraq Moves Toward Land Reform," *Foreign Agriculture*, U. S. Department of Agriculture, September, 1951.

[Text continues on p. 97--Analyst]

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COTTON IN THE MIDDLE EAST

Table 32

IRAQ: Area Under Cultivation by Crops as Per Cent of Cultivated Area 1948

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Crop	Per Cent of Total
	Per Cent
Rice	12.2
Sesame	2.5
Maize	1.4
Green Gram	1.0
Millet	.9
Wheat	40.2
Barley	40.4
Linseed	.1
Lentils	.4
Chickling	.3
Cotton	.3
Total	100.0
Total Acres under Cultivation	5,877,494

SOURCE: Office of Foreign Agricultural Relations, United States Department of Agriculture.

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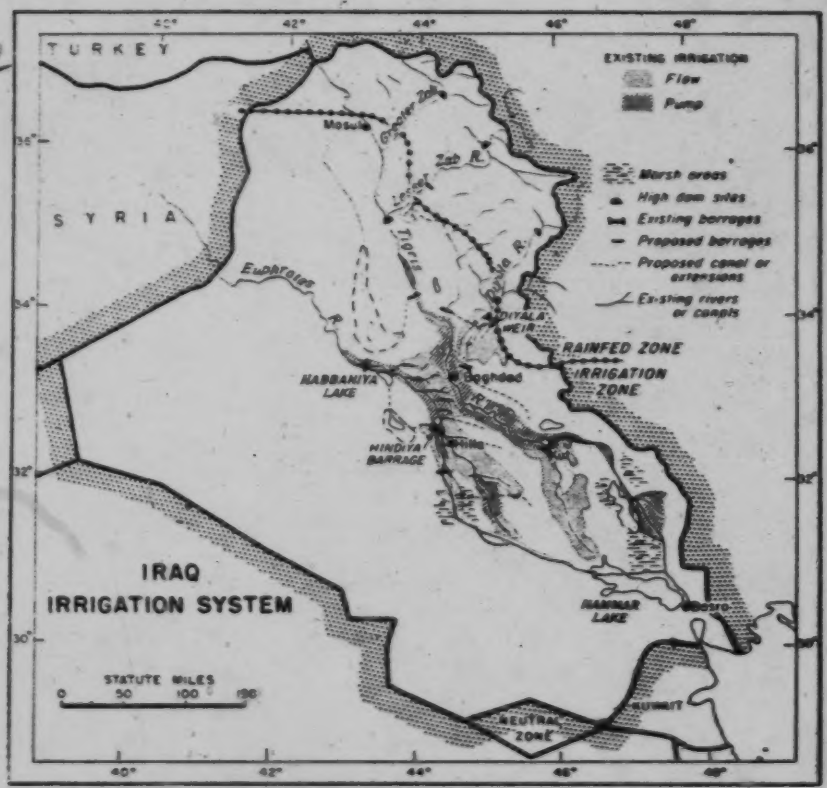

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COTTON IN IRAQ

Tigris, and a large reservoir at Bekhme in the mountains on the Great Zab. The Mission endorsed these projects and recommended others to compensate for diversion and to balance the systems. 312

The Iraq Irrigation Development Commission believes that the area under irrigation can be increased to 12 million acres by the installation of additional storage facilities, by drainage, rehabilitation, and by new supplies of water.[44]

It is agreed generally that the rain-fed zones in the north must continue to depend primarily on rainfall. Although no accurate estimates are available, the total area which might be available for cultivation in this area is thought to be substantial.

Along with irrigation, an important means of improving productivity is drainage. This would have an immediate effect; other proposals depend on the necessarily slow process of persuading farmers to abandon age-old methods of cultivation. 241 311

As much as 20 to 30 per cent of the cultivated land is said to be abandoned because of salt accumulation. On a large part of the remaining land, yields have declined as much as 50 per cent. Drainage—almost totally neglected—the report concluded, should therefore be prosecuted with utmost vigor.[45]

MECHANIZATION

Because of the cost, the Mission predicted that mechanization would proceed slowly. This conclusion was reached in the face of experience which shows that tractor ploughing may increase yields 20 to 50 per cent, largely through more effective destruction of weeds and better preparation of the soil.[46] No doubt mechanization will become increasingly important as additional land is placed under cultivation and labor becomes scarce. 241 407

About 750 tractors and 320 combines are in the country at the present time. A government agency owns 75 of the combines and 81 tractors and plans to import an additional 2,500 tractors and 550 combines with auxiliary equipment.[47] About 50 per cent of the machinery will be retained at government-owned tractor stations and rented or let out under contract.[48] The rest will be sold on easy terms to the farmers.

The International Bank approved a modified version of this machinery program but suggested that rental charges be increased to make the project self-sustaining, and adequate repair shops and demonstration and training programs were recommended.

SOIL BUILDING

It is obvious that the fertility of the soil needs to be replenished. [134] 242

Cultivation of soil-building and forage crops is said to be virtually unknown. Attention needs to be given to the production of legumes. Commercial fertilization must be studied and, if possible, plants should be built to produce inorganic and organic materials. Soil analyses also are generally needed.

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44 *Economic Development of Iraq*, op. cit., p. 16.
45 *Ibid.*, p. 17.
46 *Ibid.*, p. 18.
47 *Ibid.*, p. 19.
48 *Final Report of the United Nations Economic Survey*, op. cit., p. 33.

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COTTON IN IRAQ

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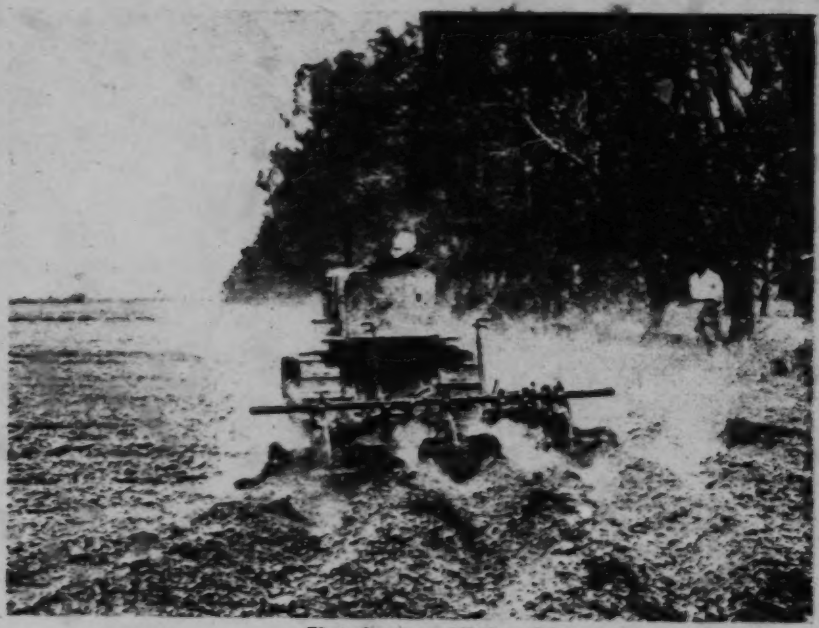

—Photo Courtesy of Technical Cooperation Administration

Modern tractors with gang ploughs are now in general use in Iraq for ploughing cotton. Because the land is so heavy, tractors are usually of the heavy-duty track type. Most of the tractors are owned by the government and rented with drivers to farmers on an hourly basis. The Iraq Government is conducting experiments with all types of mechanical equipment in the hope that new lands in the rainfed areas to the north, too sparsely populated to farm with hand labor, may be brought into production with complete mechanization.

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These plants have been found to set 75 per cent of their bolls before the end of August.

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Dr. Shelby Cain, cotton agronomist from Texas A. & M. College supplied by the Point Four Program, is concentrating on this problem in the cotton breeding program. He will be assisted by two Iraqi specialists now being trained at Texas A. & M. To some observers it appears that more work is needed on cultural practices before a full program on cotton breeding is started. For instance, the influence of planting dates, irrigation, fertilization, and cultivation on plant growths in this environment needs to be investigated before the more fundamental research in genetics and breeding can be used effectively.

Fertilization

Research on the problem of maintaining soil fertility is needed also and is included in the broad program for the future. There is an obvious deficiency of nitrogen and humus in the soil, and probably other plant foods. Much of the land in both of the main valleys has been under continuous cultivation

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163 lation, and the death rate, 25 to 35. The
165 discrepancies in reporting are probably less in the case of deaths than of births.

On the basis of the health district populations for 1950, the infant mortality rate was calculated at 98 per 1,000 live births. The death rate of infants under 1 year was 14 per cent of the total deaths, and of children under 5 years, about 23 per cent. Local observers estimate that the mortality in infants under 1 year approximates 300 to 350 per 1,000 live births among most rural and impoverished urban communities, and that it reaches almost 500 per 1,000 live births in children under 5 years of age. Intestinal diseases, undernutrition, respiratory infections and malaria are prominent among the causes of death in infancy and early childhood.

Social Economy

241 Agriculture and the petroleum industry together form the basis of Iraq's economy. Although this region was one of the chief granaries of the world centuries before the Christian Era, the present agricultural resources of the potentially fertile Tigris and Euphrates river basins are only partially developed. About 75 to 80 per cent of the inhabitants are engaged in farming or pastoral pursuits, but progress is retarded by the prevailing forms of land tenure, shortage of labor supply and inefficient methods
311 of cultivation. In 1950, less than one fifth
241 of the arable land, normally estimated at 25 to 30 million acres, was under production. Extensive areas of the alluvial plain are cultivated by means of irrigation, but improper drainage often results in considerable annual loss of soil fertility. A system
427 of tenancy farming predominates in most
423 sections of the country. The proportion of land-owning peasants is small and largely restricted to the northern provinces. In central and southern Iraq many families are
[441] migratory cultivators who work on a share-cropping basis for wealthy and, usually, absentee landlords.

241 Cereals, tobacco and cotton are important

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241 commercial crops in the rain-fed zones of the north; dates, cereals and cotton, in the south. The date-palm groves in the irrigated lands along the Shatt al Arab and the Euphrates rivers, and in scattered areas along the Tigris, furnish almost one third of the 233 world's supply of dates. Sheep, goats, cattle and other livestock are raised in large numbers by the nomadic and the seminomadic 439 peoples. The chief agricultural exports are dates, barley and other grains, cotton, wool, hides and licorice: this last-named item grows wild in many localities in the south. 242 The government is promoting the adoption of modern methods of farming and animal husbandry and the expansion of irrigation facilities. It operates special agricultural schools and experimental farms in different parts of the country, as well as a date research station near Basra. Within the last few years it has initiated settlement and demonstration projects on state lands at Dujayla, near Kut; at Shahrizor, near Sulaimaniya; at Huwaija, near Kirkuk; and at Sinjar, near Mosul.

135 With the exception of the oil reserves, the mineral resources of Iraq are negligible. Small deposits of lignite, gypsum, sulfur and other minerals are known to exist in the north, while salt beds are found in widely 472 distributed areas. Industrial development is 438 slight, in spite of the impetus supplied by the shortage of materials during the recent war years. Small craft industries flourish in the urban centers, and a few modern factories have been established in Baghdad and Mosul for the processing of local products. These consist primarily of plants for the manufacture of textiles, cement, bricks, distilled liquors, soaps and cigarettes.

125 The petroleum industry has expanded rapidly since the discovery of oil, in 1927, at Baba Gurgur, in the Kirkuk region. The reserves, which are reputed to be among the richest in the Middle East, provide a pri- 471 mary source of wealth for the country. The Iraq Petroleum Company holds concessions originally granted in 1925, covering the lands east of the Tigris River and north

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pal population centers and radiate from Baghdad and Mosul to cities in Syria, Iran and Turkey. The Tigris is navigable to barges from Basra to Baghdad throughout the year, and to smaller craft as far as Mosul during the high-water season. The Shatt al Arab is open to ocean-going vessels, and Basra, about 85 miles from the Persian Gulf, is one of the major ports of the Middle East. A government-operated railroad, part of the famous "Berlin to Baghdad" railway, runs from Basra to Baghdad and Mosul, with connections through Aleppo to Istanbul. A branch line extends from Baghdad to Kirkuk, Erbil and Khanaquin. A government-owned airline serves Iraq and the neighboring countries, while international lines from Europe to Africa and the Far East stop at Baghdad and Basra.

Food and Nutrition

The nutrition of the people is governed by the cultural habits of the different racial and social communities, the economic status of the individual families and the food supplies available under diverse climatic conditions. Undernutrition is prevalent among the poorer inhabitants—tenant cultivators, urban laborers and nomadic tribes—who make up over three quarters of the population. Wheat, barley, rice and dates are the staple food crops of the country, while vegetables and fruits, other than dates, are frequently scarce. Wheat is widely grown, primarily in the rainfall areas of the north, but also in the irrigated riverain zones of the south. Barley is cultivated extensively, and, like wheat, is used in the preparation of breads and of *burghul*, a coarse-grained cereal product typical of this region. Millet and maize are common crops in the south. Rice is produced in certain lowland districts in the Kurdish highlands and on the fringes of the southern marshes, and is a popular food among all sections of the population. Peas, beans and lentils are usually consumed throughout the year, and tomatoes, eggplant and different root and green vege-

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241 tables in season. Citrus fruits flourish in the irrigated areas of Kerbela province and in the Diyala river valley, while grapes, apricots and other fruits grow in various localities. Numerous species of dates are cultivated, especially in the Shatt al Arab and lower Euphrates basins: they represent one of the basic foods of the people.

511 The financial circumstances of most families prohibit the consumption of meat,
233 except at irregular intervals. Sheep and goats are raised in large numbers, both by the settled and the nomadic peoples, and constitute the principal sources of
226 meat. Fish are a valuable food among
231 the peoples living in the river valleys and along the coast. Fowl are kept in the rural
262 villages. Milk is a standard article of diet
334 wherever it is obtainable. The milk of sheep or goats is most widely used, but that of cows, water buffaloes and camels is utilized in many areas. Milk is normally consumed in the form of buttermilk or a soured milk product, known as *leban*. Cheese is also made, but it is rarely as popular as in other Arab countries. Clarified butter and the fats derived from the tail tissues of the local breeds of sheep are important sources of fat among all population groups.

262 The least diversified diets are probably found among the nomadic tribes, who subsist on the products of their herds, supplemented by dates and wheat or barley breads. Camel's milk is employed by the
[234] nomadic Bedouin. The tribal Arabs of the southern marshes depend largely upon the milk of the water buffalo, fish and wild waterfowl, rice and occasional edible rushes.

146 Measures to raise the standards of nutrition among the various urban and rural groups are being studied by educational and
165 health authorities. Improper feeding in in-
853 fancy, particularly in the course of weaning, which is often deferred until the second year of life, is a factor contributing to the
146 high mortality among young children. The
657 organization of a national nutrition committee, to function in an advisory capacity to the governmental agencies concerned, and

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Post-War Period, 1945 to 1954

In the early post-war period there was little development. Petroleum production, and the revenue accruing to the Government therefrom, remained at the pre-war level or below and agricultural and industrial output showed little change. The deficit in the balance of payments was met by drawing on foreign exchange reserves. The Government budget showed deficits, and little was spent on capital works. By 1950, however, the situation began to change. Output of petroleum increased rapidly, and new agreements with the producing companies greatly raised government receipts. With the technical and financial assistance of the International Bank for Reconstruction and Development, a large-scale development plan was drawn up which is at present being carried out. The completion of the various projects under way should result in a considerable increase in the national income.

Production

Agriculture

The increase in area and output achieved during the Second World War was generally maintained during the post-war period (see table 26). In recent years, there seems to have been a further extension in acreage, owing to increased irrigation and greater mechanization. 1/ Yields have continued to fluctuate in response to weather conditions, floods and attacks by locusts and other insect pests; total output has therefore varied considerably from year to year. The experience of recent years, notably that of 1952, has, however, shown that, thanks to the co-operation of other Middle Eastern and foreign governments, locust attacks cause much less damage than they did formerly. Similarly, completion of the irrigation works at present under way should greatly reduce the danger of floods like that of 1954, which destroyed many crops and damaged property.

The agricultural and livestock census 2/ of 1952/53, the first of its kind, puts the total agricultural holdings of Iraq at 6,384,000 hectares, of which

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1/ The number of pumps used in irrigation rose from 2,757, with a total horsepower of 91,332 in 1945, to 4,339, with a horsepower of 167,288 in 1953 (Ministry of Economics, Statistical Abstract 1953 (Baghdad)). In addition, the construction of canals made it possible to extend appreciably the area irrigated by existing dams. Early in 1951, there were 320 combines and 750 tractors (International Bank for Reconstruction and Development, The Economic Development of Iraq, (Baltimore, 1952), page 19). In 1952 and 1953, 625 combines and 502 tractors were sold to farmers; of these over two-thirds were sold in 1953 (Statistical Abstract). There were 2,091 tractors in 1954 (Le Commerce du Levant, 11 August 1954 (Beirut)).

2/ Ministry of Economics, Statistical Abstract 1953 (Baghdad).

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Table 26. Iraq: Area and Production of Principal Crops, 1934-38, 1945, 1948 and 1950 to 1954

Crop	1934-38	1945	1948	1950	1951	1952	1953	1954
Area (thousands of hectares):								
Wheat	661	777	963	950	863	882	1,046	...
Barley	743	826	974	1,000	927	700	1,211	...
Rice	152	194	295	218	189	210	129	...
Cotton	16	...	...	32	44	40	24	...
Production (thousands of metric tons):								
Wheat	478	400	301	545	487	480	762	800
Barley	575	650	570	851	839	800	1,111	700
Rice	205	245	350	242	190	250	200	250
Cotton	2	1	2	8	6	3	4	...
Dates	260	...	301a/	305	350	370	350	...

Source: Food and Agriculture Organization, Yearbook of Food and Agricultural Statistics (Rome), Monthly Bulletin of Agricultural Economics and Statistics; agricultural census of 1952/53; Le Commerce du Levant (Beirut), 25 December 1954.

a/ 1947.

2,752,000 hectares are rainfed, 2,912,000 irrigated 1/ and 644,000 hectares uncultivable. Of the total, 2,527,000 hectares, or 40 per cent, were cropped; 2,795,000 hectares, or 44 per cent, were left fallow; 126,000 hectares, or 2 per cent, was under fruit trees and vines; 231,000 hectares, or 4 per cent, consisted of pastures; and 42,000 hectares, or 1 per cent, consisted of woodland. Double cropping is practised in a few areas.

The census showed that the area planted to the major field crops was as follows: barley 1,211,000 hectares; wheat, 1,046,000; rice, 129,000; maize, 54,000; cotton, 24,000; millet, 22,000; sesame, 22,000; tobacco, 10,000; vegetables, 45,000; others, 38,000; total, 2,601,000 hectares. Barley is to be found in most parts of the country, while wheat is grown mainly in the north, the provinces of Mosul and Kirkuk accounting for half the total area; cotton and fruit trees are grown mainly around Baghdad and in other central provinces, and rice in the south; date cultivation is concentrated around the town of Basra. 2/

1/ Of this total, 1,685,000 hectares are irrigated by flow, 1,120,000 hectares by pumps and 107,000 by water wheels and other means.

2/ The census put livestock on agricultural holdings as follows: horses, 137,000; cattle, 712,000; buffaloes, 47,000; sheep, 4,484,000; goats, 1,613,000; donkeys, 399,000; camels, 38,000; and mules, 57,000.

433 There has been little change in the crop pattern in recent years. In 1950, 311 under the stimulus of rising world prices, the area planted to cotton increased, but the damage caused by pests, together with the fall in prices, caused heavy 241 losses and led to a shift to other crops. There has also been an extension of the area planted to fruits and vegetables.

242 The Government has taken several important measures to aid agriculture. In 1952, in order to improve the quality of dates, the government-owned Iraqi Dates Association contributed 49 per cent of the capital of a company which will market the crop. In 1953, the Government appropriated funds for the building of grain silos with a capacity of 150,000 tons, in order to improve quality, since low grading depresses export prices. The Agricultural Machinery Administration rents "machinery to farmers and, in addition, is responsible for testing and demonstrating new machinery, licensing of imports and controlling the distribution of the limited supply of spare parts". 1/ The activities of the Agricultural Bank are discussed below.

423 Among the major obstacles to agricultural development has been the land 241 tenure system. The uncertainty of land titles has by now been largely eliminated by the work carried out since passage of the land settlement law of 1932. By the end of 1953, titles to 16,126,000 hectares had been settled; this represented 68.4 per cent of the area of the country, excluding the desert regions. Another obstacle is the unequal distribution of land. The agricultural census showed that there were only 125,000 holdings, with an average area of 51 hectares per holding. Of these, 24,000 holdings were under 1 hectare, 26,000 between 1 and 5 hectares, 16,000 between 5 and 10 hectares and 19,000 between 10 and 20 hectares. Thus, 85,000 holders, or 68 per cent of the total, owned about 3 per cent of the total area. At the other extreme, some 33,000 holders, with over 100 hectares each, owned some 85 per cent of the total area. The majority of the agricultural population is landless.

311 The Government has attempted to remedy this situation by settlement schemes 241 on government-owned land, which accounts for nearly two-thirds of the settled 185 area. Following a successful experiment at Dujaila, 4,284 farmers were settled, in five projects with a total area of 198,000 hectares, and by the end of 1954, 10,200 farmers had been settled on 510,000 hectares. 2/ Farmers are organized in supply and marketing co-operatives. They are given the land free of rent for ten years, after which those who have made good are granted title without charge. 3/ Further projects are under way, including the distribution of 1,125,000 hectares in Mosul province, the distribution of 100,000 hectares near Baghdad, the expansion of the Hawijah settlement and the distribution of land near Basra and along the southern Euphrates. 4/

1/ International Bank for Reconstruction and Development, The Economic Development of Iraq, page 20.

2/ The Iraq Times (Baghdad), 25 October 1954.

3/ For further details see United Nations Department of Economic Affairs, Progress in Land Reform (1954), page 105.

4/ The Iraq Times, 14 December 1954, 4 January 1955, 8 January 1955 and 7 February 1955.

35: Hooper and Field 8-5 (1934) 1937 MAI Iran MAI
Iraq MHI

I-I
824*
278*
372
[247]
[245]

Field 264; 4, 12, 36, 53 (Iraq); W.H.M.M. 150739; K.B. 335.

The castor oil plant[1] is a native of India, but is common now throughout tropical and subtropical countries. In Iraq and Iran it is cultivated as a windbreak for cotton and other summer crops and in gardens as an ornamental plant. It may attain a height of 10 meters and be a perennial tree, but in cooler climates it is either a shrub or an annual herb. With variations of the plant there are also varieties, large and small, of the seeds. The four samples from Iraq were classed as follows: "Abhangi seeds" 15 by 9 mm., "ordinary" 13 by 10 mm., "Indian red-stemmed" 11 by 8 mm., "Syrian Baladi" 13 by 11 mm. The most important constituent of castor seed is the fixed oil, which exists to the extent of about 50 per cent. The oil is used as a lubricant, as an illuminant, and in medicine as a safe purgative. The oil cake contains all the poisonous property originally present in the seed, hence can not be used as a cattle food; it is, however, an excellent manure and fuel.

[241]

Roccella Montagnei Bél. (Ascolichenes, Roccellaceae)

824*
278*

دوالة

Davālah (Ham.); a lichen.

Field 28A; W.H.M.M. 150824; K.B. 336.

Achundow refers this drug to *Muscus arboreus*, and gives the Persian names as Dawalak and Karbasu and the Arabic name as Aschna (*Usnea* sp.). The Persian name Davālah is applied to more than one kind of lichen, since Dymock gives *Parmelia kamtschadalis* Esch. as the source of this drug in the Indian bazaars (Ph. Ind. 3: 627). In the Field collection from Baghdad, No. 28A, this drug occurs under the name of "Lihayat as-shāyib." Some of the Parmelias are used as a dye. They are gray lichens, in broken pieces, having emollient and astringent properties, used in a bath or as a poultice.

Rosa damascena Mill. (Rosaceae)

824*
213
278*

گل سرخ

Gul-i-surkh, "red flower" (Teh.); Ward (Ar.); flowers of red rose.

Field 42A; W.H.M.M. 150763.

The rose of Damascus is largely cultivated in western Asia. In Turkey, Bulgaria, and the south of France this species yields attar of rose and is the flower from which the official rose water is prepared.

The petals are slightly astringent, and are used chiefly as an agreeable astringent or as a coloring agent. "Gulanjabin," of rose

[346]

[1] [Ricinus communis --ANALYST]